NAPLES
63rd IAC 2012
INTERNATIONAL ASTRONAUTICAL CONGRESS

ASTRONAUTICA AD PACEM HOMINUMQUE PROGRESSUM

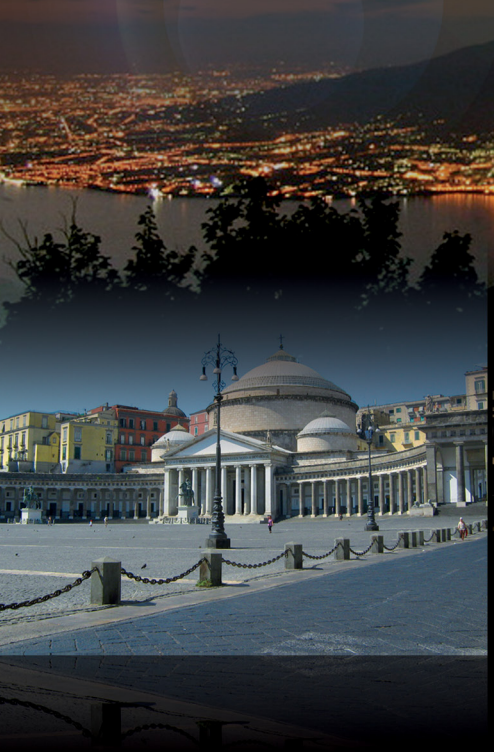
63rd IAC

International Astronautical Congress

www.iac2012.org

1 - 5 October 2012, Naples, Italy

Call for Papers & Registration of Interest



Space science and technology for the needs of all

agenzia spaziale italiana

IISL

IAA · INTERNATIONAL ACADEMY OF ASTRONAUTICS

53rd IAC 2012

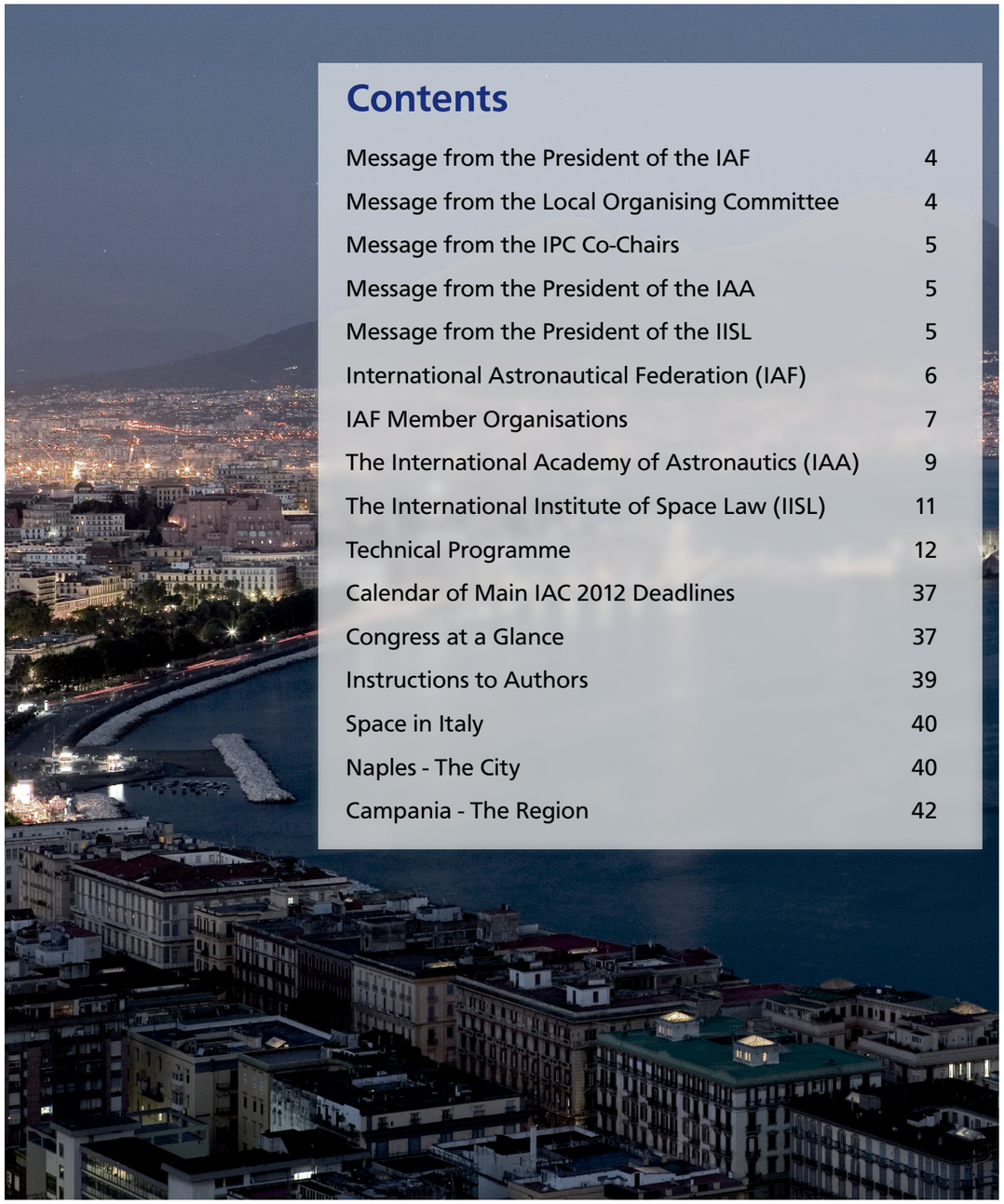
INTERNATIONAL ASTRONAUTICAL CONGRESS

NAPLES IAC 2012

MOSTRA D'OLTREMARE, 01 - 05 OCTOBER

Supported by:

Official sponsor:



Contents

Official Media Sponsor

Supporting Media

Message from the President of the IAF

It is my pleasure to invite you to attend the 2012 International Astronautical Congress which will take place in the beautiful city of Naples. While this is the first Congress to take place in Naples, heart of the historic region of Campania, this is the fourth Italian IAC.

The 7th International Astronautical Congress, organised by the Associazione Italiana Razzi (AIR), was held in Rome in 1956 and graced by the presence of Pope Pius XII. It came at an important time for the space industry being the starting pistol for the International Geophysical Year. This culminated just one year later with the launch of Sputnik. The Associazione Italiana di Aeronautica e Astronautica (AIDAA) invited participants to Rome for the 1981 Congress. This particular Congress was vital to the development of the Unispace series of United Nations sponsored space conferences. Organised in 1997, also by AIDAA, the 48th International Astronautical Congress was held in a former Fiat plant in Turin. The stunningly successful exhibition became the industry benchmark for all those which followed.

In 2012, the space industry stands at an important crossroads with the continuing emergence of space-faring powers such as China and India, the consolidation of international cooperation in Europe, Africa and South America and the growing importance of the commercial sector in the United States.

I am confident our Italian hosts, along with the Federation, the IAA and IISL, will produce a Congress of remarkable significance.

Berndt Feuerbacher
President, International Astronautical Federation

Message from the Local Organising Committee

IAC 2012 brings prestige to Italy, Naples and the Campania region in many ways.

It rewards the work and involvement of Italian aerospace. The Naples region and the surrounding province have had a long involvement with this industry with a widespread and innovative industrial base, ranging from small companies, through medium-sized high technology enterprises to large, leading world-class organisations. Italy has always been able to deploy its great abilities in this field, achieving great successes.

Representatives of national and regional politics, industry, universities, the world of research, but most of all, the whole Campania region, has come together with ASI to help set up and organise the 63rd International Astronautical Congress. This makes Naples and Campania excel in this important global context.

The thousands of delegates will enjoy the renowned Neapolitan hospitality which has distinguished the city over the centuries. Naples will show the world that it is a land of excellence - not only for its food and landscape, but also because of its position at the leading edge of high technology.

Enrico Saggese
Chair, Local Organising Committee

Message from the IPC Co-Chairs

Today, space is no longer just a field of advanced technological development and of scientific research of excellence, but has become an essential asset for everyday life. Space has spurred countless scientific and technological achievements which are commonly used in aeronautics, medicine, material science and production, in information and communications technology. In parallel, more and more services are carried out through the use of space applications, ranging from detection of natural disasters and environmental monitoring to global navigation and telecommunication. Using space missions to build a better understanding of the universe fulfills our centuries-old curiosity and leads humanity into the future, opening up new frontiers of knowledge.

The International Astronautical Congresses have always represented an arena in which issues have been discussed with friendship and among experts: scientists, technicians and managers from universities, agencies, research centres and industry. At the same time it introduces students and young professionals to the field.

In 2012 the IAC will come to Naples for the first time, the hometown of the late Professor Luigi G. Napolitano, a former president of the IAF and an extraordinary space scientist who marked pioneering work in fields such as microgravity and aero-thermochemistry of re-entry. The theme of the conference will be "Space science and technology for the needs of all" and from one of the oldest European cities, we will give a look into the future and into how that future will be increasingly tied to space, in the interest and for the welfare of all of us.

We look forward to welcoming you to IAC 2012 in Naples, Italy, for an exciting experience.

Antonio Moccia and LI Ming
IPC Co-Chairs

Message from the President of the International Academy of Astronautics

The International Academy of Astronautics (IAA) is pleased to invite you to attend our symposia throughout the week. In addition to organising yearly around 20 conferences worldwide, the Academy organises 11 symposia every year at the IAC, representing nearly one third of the IAC programme, and will co-host in Naples some exciting sessions with the IAF and the IISL.

Italy, ranking 7th within IAA membership, is important to us. Indeed, the Academy was shaped by famous Academicians space pioneers including Italians L. Broglio, L. Napolitano and P. Santini. In addition, last year during the unprecedented IAA Heads of Space Agencies Summit, Giovanni Bignami received the highest award of the International Academy of Astronautics, the von Karman Award and this year Enrico Saggese is elected IAA Trustee.

We look forward to your presence in Naples.

Gopalan Madhavan Nair
President of the International Academy of Astronautics

Message from the President of the International Institute of Space Law

On behalf of the International Institute of Space Law I am pleased to invite you to attend our 55th Colloquium on the Law of Outer Space. We have selected topical issues that will be addressed and debated by the world's finest space lawyers, and will co-host some exciting sessions with our sister organisations, the IAF and the IAA.

We will also welcome many promising students in the context of the prestigious Manfred Lachs Space Law Moot Court Competition, judged by members of the International Court of Justice, and during our annual Young Scholars session.

More and more space players know that legal issues of space activities merit proper attention – please join us in Naples!

Tanja Masson-Zwaan
President of the International Institute of Space Law

International Astronautical Federation (IAF)

Founded in 1951, the International Astronautical Federation is the world's leading space advocacy body with more than 200 members on six continents including all leading space agencies, space companies, societies, associations and institutes worldwide.

Following its theme "A space-faring world cooperating for the benefit of humanity", the Federation advances knowledge about space, fostering the development and application of space assets by advancing global cooperation.

As organiser of the annual International Astronautical Congress (IAC), and other meetings on specific subjects, the IAF actively encourages the development of astronautics for peaceful purposes and supports the dissemination of scientific and technical information related to space.

International Astronautical Federation
94, bis Avenue de Suffren
75015 Paris, France
Tel: +33 1 45 67 42 60
Fax: +33 1 42 73 21 20
www.iafastro.org

Members of Bureau 2011

PRESIDENT
Berndt Feuerbacher
Professor
DLR, Germany

PAST-PRESIDENT
James V. Zimmerman
President
International Space Services, United States

GENERAL COUNSEL
Vladimir Kopal
Professor of Law
West Bohemian University, Czech Republic

HONORARY SECRETARY
Hans Hoffmann
Director
ORBComm, Germany

VP: IAC EVOLUTION, IPC
Maria Antonietta Perino
Head of Advanced Exploration Programmes, Infrastructures and Transportation Systems
Thales Alenia Space Italia, Italy

VP: INDUSTRY RELATIONS AND MEMBERS
J. Patrick Schondel
Vice President
Business Development Space Exploration, The Boeing Company, United States

VP: HONOURS AND AWARDS
V. S. Hedge
Chairman and Managing Director
Antrix Corp., India

VP: INSTITUTIONAL RELATIONS AND MP LIAISON
Jean-Jacques Dordain
Director General
European Space Agency

VP: TECHNICAL ACTIVITIES
Tetsuo Yasaka
Professor Emeritus
Department of Aeronautics and Astronautics, Kyushu University, Japan

VP: INTERNATIONAL ORGANISATIONS RELATIONS AND DEVELOPING COUNTRIES
Gerard Brachet
Space Policy Consultant
Sic Itur, France

VP: WEB OUTREACH AND SOCIETIES
Marc Heppener
President
Netherlands Society for Aerospace, The Netherlands

VP: FINANCE
David Kendall
Director General
Space Science, Canadian Space Agency, Canada

VP: YOUTH AND WORKFORCE DEVELOPMENT
Lyn Wigbels
Executive Vice President
American Astronautical Society, United States

VP: INTERNATIONAL RELATIONS
Jie Yuan
Vice President
China Aerospace Science and Technology Corporation (CASC), China

SPECIAL ADVISOR TO THE IAF PRESIDENT
Anne-Marie Mainguy
Office National d'Etudes et de Recherches Aérospatiales (ONERA), France

PRESIDENT IAA
Gopalan Madhavan Nair
International Academy of Astronautics; Department of Space, Indian Space Research Organisation, India

PRESIDENT IISL
Tanja Masson-Zwaan
International Institute of Air and Space Law, University of Leiden, The Netherlands

EXECUTIVE DIRECTOR
Philippe Willekens
Executive Director
International Astronautical Federation, France

IAF Secretariat

Philippe Willekens, Executive Director
Christian Feichtinger
Valérie Leenhardt, Administrative Assistant

Juliane McCarty, Public Affairs and Communications Officer
Scott Hatton, Content Manager

Philippe Moreels, Industry Relations and Project Manager
Pierre-François Mouriaux, Technical Coordinator

IAF Member Organisations

Associations and Professional Societies

- Agrupación Astronáutica Española, *Spain*
- American Astronautical Society (AAS), *United States*
- American Institute of Aeronautics and Astronautics (AIAA), *United States*
- Association Aéronautique & Astronautique de France (AAAF), *France*
- Association of Arab Remote Sensing Centers (AARSC), *Libya*
- Association of Specialist Technical Operators in Space (ASTOS), *United Kingdom*
- Associazione Italiana di Aeronautica e Astronautica (AIDAA), *Italy*
- Astronaute Club Européen (ACE), *France*
- Astronautical Society of India, *India*
- ATUCOM - Tunisian Association for Communication and Space Sciences, *Tunisia*
- Austrian Research Promotion Agency, *Austria*
- Canadian Aeronautics & Space Institute (CASI), *Canada*
- Chinese Society of Astronautics, *China*
- Croatian Astronautical and Rocket Federation (HARS), *Croatia*
- Cyprus Astronautical Society, *Cyprus*
- Czech Space Alliance, *Czech Republic*
- Danish Astronautical Society, *Denmark*
- Deutsche Gesellschaft für Luft-und and Raumfahrt, Lilienthal Oberth e.V. (DGLR), *Germany*
- Engineers Australia, *Australia*
- Enterprise Estonia, *Estonia*
- EURISY, *France*
- European Conference for Aero-Space Sciences (EUCASS), *Belgium*
- Eurospace, *France*
- Federación Argentina Astronáutica (FAA), *Argentina*
- Finnish Astronautical Society, *Finland*
- GIFAS, *France*
- Hungarian Astronautical Society (MANT), *Hungary*
- Institut Français d'Histoire de l'Espace, *France*
- International Association for the Advancement of Space Safety, *The Netherlands*
- Internationaler Förderkreis für Raumfahrt – Hermann Oberth – Wernher von Braun e.V., *Germany*
- Israel Society of Aeronautics & Astronautics, *Israel*
- Japan Society for Aeronautics and Space Sciences (JSASS), *Japan*
- Japanese Rocket Society, *Japan*
- Lithuanian Space Association (LSA), *Lithuania*
- National Space Society, *United States*
- Netherlands Society for Aerospace (NVR), *The Netherlands*
- Norsk Astronautisk Forening, *Norway*
- Polish Astronautical Society, *Poland*
- Proespaço-The Portuguese Association of Space Industries, *Portugal*
- Russian Academy of Sciences, *Russia*
- Secure World Foundation, *United States*
- Space Generation Advisory Council (SGAC), *Austria*
- SpaceNed, *The Netherlands*
- Swedish Society for Aeronautics and Astronautics, *Sweden*
- SwissSpace Association, *Switzerland*
- The British Interplanetary Society, *United Kingdom*
- The Chinese Aeronautical and Astronautical Society located in Taipei, Taiwan, *China*
- The Korean Society for Aeronautical and Space Sciences, *Republic of Korea*
- The Planetary Society, *United States*
- TÜBITAK, *Turkey*
- World Space Week Association, *United States*
- X PRIZE Foundation, *United States*

Industry

- A9C Capital, *Bahrain*
- Acutronic Switzerland Ltd., *Switzerland*
- Aerojet-General Corporation, *United States*
- Ångström Aerospace Corporation (AAC), *Sweden*
- Arianespace, *France*
- Astrium GmbH, *Germany*
- Astrium SAS France, *France*
- Astrium UK, *United Kingdom*
- Astronautic Technology SDN BHD, *Malaysia*
- Carlo Gavazzi Space, *Italy*
- Dassault Aviation, *France*
- Deimos Space S.L., *Spain*
- Dutch Space, *The Netherlands*
- EADS CASA Espacio S.L., *Spain*
- EADS Sodern, *France*
- Eumetsat, *Germany*
- Eurockot Launch Services GmbH, *Germany*
- Euroconsult, *France*
- GMV, *Spain*
- GomSpace Aps, *Denmark*
- HE Space Operations, *Germany*
- IHI Aerospace Co, Ltd., *Japan*
- Invap S.E., *Argentina*
- Israel Aerospace Industries. Ltd., *Israel*
- Kayser-Threde GmbH, *Germany*
- Kentucky Space, *United States*
- Khrunichev State Research & Production Space Center, *Russia*
- Lavochkin Association, *Russia*
- Law Offices of Sterns and Tennen, *United States*
- Lockheed Martin Corporation, *United States*
- MDA Corporation, *Canada*
- Microcosm, Inc., *United States*
- Mitsubishi Electric Corporation, *Japan*
- Mitsubishi Heavy Industries, Ltd., *Japan*
- MT Aerospace AG, *Germany*
- NEC Toshiba Space Systems, Ltd., *Japan*
- Neptec Design Group, *Canada*
- Northrop Grumman Space Technology, *United States*
- Novespace, *France*
- OHB-System AG, *Germany*
- Ramirez de Arellano y Abogados, S.C. Law Firm, *Mexico*
- RUAG Aerospace Ltd., *Sweden*
- S.A.B.C.A. *Belgium*
- S.P. Korolev Rocket and Space Corporation Energia, *Russia*
- Satrec Initiative, *Republic of Korea*
- SENER Ingeniería y Sistemas, S.A., *Spain*
- Serco Europe, *Italy*
- SES, *Luxemburg*
- Sirius XM Radio, *United States*
- Sky Perfect JSAT Corporation, *Japan*
- Snecma, *France*
- Space Canada Corporation, *Canada*
- Space Commercial Services Holdings (Pty) Ltd, *South Africa*
- Space Enterprise Partnerships Limited, *United Kingdom*
- Space Systems/Loral, *United States*
- SSC, *Sweden*
- Starsem, *France*
- Sun Space and Information Systems, *South Africa*
- Sunsat Energy Council, *United States*
- Surrey Satellite Technology Ltd, *United Kingdom*

- Techno System Developments S.R.L., *Italy*
- Telesat Canada, *Canada*
- Telespazio S.p.A., *Italy*
- Thales Alenia Space Italia, *Italy*
- Thales Alenia Space, *France*
- The Aerospace Corporation, *United States*
- The Boeing Company, *United States*
- TNO, *The Netherlands*
- United Space Alliance, *United States*
- VEGA, *United Kingdom*
- Viettel Technologies Joint Stock Company, *Vietnam*
- Virgin Galactic L.L.C. *United States*
- Volvo Aero Corporation, *Sweden*
- Yuzhnoye State Design Office, *Ukraine*
- ZARM Fab GmbH, *Germany*

Research & Development

- Andøya Rocket Range, *Norway*
- Center for Strategic and International Studies (CSIS), *United States*
- Central Research Institute of Machine Building (FSUE/ TSNIIMASH), *Russia*
- CIRA Italian Aerospace Research Centre, *Italy*
- CSIRO Marine & Atmospheric Research, *Australia*
- European Space Policy Institute (ESPI), *Austria*
- Federal Aviation Administration Office of Commercial Space Transportation (FAA/AST), *United States*
- ICARE-CNRS, *France*
- Instituto de Aeronáutica e Espaço (IAE), *Brazil*
- Instituto Mexicano del Espacio Exterior, INMEE, A.C., *Mexico*
- Instituto Nacional de Pesquisas Espaciais (INPE), *Brazil*
- Instituto Nacional de Técnica Aeroespacial (INTA), *Spain*
- Italian National Research Council - CNR, *Italy*
- Korea Astronomy and Space Science Institute, *Republic of Korea*
- Libyan Center for Remote Sensing and Space Science (LCRSSS), *Libya*
- National Aerospace Laboratory (NLR), *The Netherlands*
- National Oceanic and Atmospheric Administration (NOAA), *United States*
- Nigerian Meteorological Agency, *Nigeria*
- Odyssey Space Research, *United States*
- Office National d'Etudes et de Recherches Aérospatiales (ONERA), *France*
- Rocket Research Institute, Inc., *United States*
- Samara Space Centre "TsSKB-Progress", *Russia*
- Shamakhy Astrophysical Observatory, *Azerbaijan*
- U.S. Geological Survey, *United States*
- von Karman Institute for Fluid Dynamics, *Belgium*

Space Agencies and Offices

- Aerospace Research Institute (ARI), *Iran*
- Agence Spatiale Algérienne (ASAL), *Algeria*
- Agustín Codazzi Geographic Institute, *Colombia*
- Belgian Science Policy (BELSPO), *Belgium*
- Brazilian Space Agency (AEB), *Brazil*
- Bulgarian Aerospace Agency, *Bulgaria*
- Canadian Space Agency (CSA), *Canada*
- Centre National de la Cartographie et de la Télédétection (CNCT), *Tunisia*
- Centre National d'Etudes Spatiales (CNES), *France*
- Centre Royal de Télédétection Spatiale (CRTS), *Morocco*
- Centro de Investigación y Difusión Aeronáutico-Espacial (CIDA-E), *Uruguay*
- Centro Para el Desarrollo Tecnológico Industrial (CDTI), *Spain*
- Comisión Nacional de Actividades Espaciales (CONAE), *Argentina*
- Commission d'Astronautique de l'Academie Roumaine, *Romania*
- Czech Space Office (CSO), *Czech Republic*
- Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), *Germany*
- Ecole Polytechnique Fédérale de Lausanne (EPFL), *Switzerland*
- Ecuadorian Civilian Space Agency (EXA), *Ecuador*
- European Space Agency (ESA)
- Federal Space Agency (ROSCOSMOS), *Russia*
- General Organization of Remote Sensing (GORS), *Syria*
- Geo-Informatics and Space Technology Development Agency (GISTDA), *Thailand*
- Indian Space Research Organization (ISRO), *India*
- Indonesian National Institute of Aeronautics and Space (LAPAN), *Indonesia*
- Israel Space Agency (ISA), *Israel*
- Italian Space Agency (ASI), *Italy*
- Japan Aerospace Exploration Agency (JAXA), *Japan*
- King Abdulaziz City for Science & Technology (KACST), *Saudi Arabia*
- Korea Aerospace Research Institute (KARI), *Republic of Korea*
- National Aeronautics and Space Administration (NASA), *United States*
- National Aerospace Agency (NASA) of Azerbaijan Republic, *Azerbaijan*
- National Research Foundation (NRF), *South Africa*
- National Space Agency of Ukraine (NSAU), *Ukraine*
- National Space Research and Development Agency, Abuja, Nigeria (NSRDA), *Nigeria*
- Netherlands Space Office (NSO), *The Netherlands*
- Norwegian Space Centre (NSC), *Norway*
- Pakistan Space and Upper Atmosphere Research Commission (SUPARCO), *Pakistan*
- Space Technology Institute (STI), *Vietnam*
- UK Space Agency, *United Kingdom*

Universities

- Centre Spatial de Liège, *Belgium*
- Department of Space Studies, University of North Dakota, *United States*
- International Space University (ISU), *France*
- Moscow Aviation Institute, *Russia*
- RMIT University, Australia, *Australia*
- School of Engineering, UNAM, *Mexico*
- Space Policy Institute, George Washington University, *United States*
- Stellenbosch University, *South Africa*
- The John Hopkins University Applied Physics Laboratory, *United States*
- University of Alabama in Huntsville, *United States*
- University of the Western Cape, *South Africa*
- University of Valencia, *Spain*
- University of Vigo, *Spain*
- Victorian Space Science Education Centre, *Australia*

Membership status as of 3 October 2011

The International Academy of Astronautics (IAA)

The International Academy of Astronautics (IAA) was founded in 1960 by Theodor von Karman. The Academy is an independent international community of leading experts committed to expanding the frontiers of space, the newest realm of human activity. To foster the development of astronautics, the Academy undertakes a number of activities, including the recognition of outstanding contributors through election and awards. It also facilitates professional communication, develops and promotes new ideas and initiatives, engages the public, and fosters a sense of community among the members. This is a unique non-governmental organisation established in 1960 and recognised by the United Nations in 1996.

It is an honorary society with an action agenda. With 1200 elected members and corresponding members from 87 nations, it works closely with space agencies, industry, the academic community and the national science and engineering academies to determine needs and objectives and to help shape policy and forge cooperation by means of studies, position papers, conferences and publications. The IAA published 9 studies in 2010 and is engaged in the preparation of 40 studies. The Academy publishes the journal Acta Astronautica containing refereed papers.

The Academy now organises yearly 20 conferences and regional meetings focused on the development and promotion of new initiatives. This activity includes also, in cooperation with the International Astronautical Federation and the International Institute of Space Law, the traditional contribution to the International Astronautical Congress (IAC) where the Academy sponsors 11 Symposia. The Academy also continues to enjoy its participation in the COSPAR Assemblies by sponsoring and co-sponsoring symposia. Although the IAA has many connections to these and other similar organisations, it is distinctive as the only international Academy of elected members in broad area of astronautics and space.

President:
Gopalan Madhavan Nair,
India

Secretary General:
Jean-Michel Contant
France

Address: 6 rue Galilee, 75016 Paris
Mailing address: P.O. Box 1268-16 – 75766 Paris Cedex 16 – France
Phone: 33 (0)1 47 23 82 15 - Fax: 33 (0) 1 47 23 82 16
Email: sgeneral@iaamail.org
Website: www.iaaweb.org

IAA Board of Trustees 2011 - 2013

PRESIDENT
Gopalan Madhavan Nair
India

VICE-PRESIDENT SCIENTIFIC ACTIVITIES
Anatoly Perminov
Russia

VICE-PRESIDENT PUBLICATIONS & COMMUNICATION
Liu Jiyuan
China

VICE-PRESIDENT AWARDS & MEMBERSHIP
Yannick d'Escatha
France

VICE-PRESIDENT FINANCE
Hiroki Matsuo
Japan

PAST PRESIDENT
Edward Stone
United States

SECRETARY GENERAL
Jean-Michel Contant
France

LEGAL COUNSEL
Vladimir Kopal
Czech Republic

Trustees Section 1, Basic Sciences

Stamatios M. Krimigis (USA, Chairman)
Wing-Huen Ip (China Taiwan)
Rafael Rodrigo (Spain)
Jan Kolar (Czech Republic)
Mazlan Othman (Malaysia)
Hans Peter Roeser (Germany)
Xu Guanhua (China)

Trustees Section 2, Engineering Sciences

Byrana Suresh (India, Chairman)
Alain Bensoussan (France)
Oleksandr Degtyarev (Ukraine)
Talgat Musabeyev (Kazakhstan)
Ray Johnson (USA)
Keiji Tachikawa (Japan)
Johann-Dietrich Woerner (Germany)

Trustees Section 3, Life Sciences

Rupert Gerzer (Germany, Chairman)
Chiaki Mukai (Japan)
Chrysoula Kourtidou-Papadeli (Greece)
Igor B. Ushakov (Russia)
Gal Jean-Francois Clervoy (France)
Dumitru-Dorin. Prunariu (Romania)
Zhuang Fengyuan (China)

Trustees Section 4, Social Sciences

Peter Jankowitsch (Austria, Chairman)
Jean-Yves LeGall (France)
Seidu Oneilo Mohammed (Nigeria)
Enrico Saggese (Italy)
Mustapha Masmoudi (Tunisia)
Marius-Ioan Piso (Romania)
Wu Meirong (China)

The International Institute of Space Law (IISL)

Founded in 1960, the International Institute of Space Law (IISL) is an independent non-governmental organisation dedicated to fostering the development of space law. The membership of the Institute is composed of individuals and institutions from more than forty countries who have been elected on the basis of their contributions to the field of space law or other social sciences related to space activities. The IISL is an officially recognised observer at sessions of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) and organises a variety of conferences on space law throughout the year. The IISL holds its annual Colloquium at the International Astronautical Congress and interested authors are invited to submit abstracts this year for the Colloquium sessions.

President: Tanja Masson-Zwaan - The Netherlands

Executive Secretary: Corinne M. Jorgenson – USA

Address: 94 bis, av. de Suffren, 75015 Paris - France
Email: info@iislweb.org
Website: www.iislweb.org

IISL Board of Directors 2010-2011

Officers

PRESIDENT
Tanja L. Masson-Zwaan
The Netherlands

VICE PRESIDENT
Vladimir Kopal
Czech Republic

VICE PRESIDENT
Jonathan Galloway
United States

EXECUTIVE SECRETARY
Corinne M. Jorgenson
United States

TREASURER
Stephan Hobe
Germany

Directors

Elisabeth Back Impallomeni (Italy)
Frans G. von der Dunk (The Netherlands)
Joanne Irene Gabrynowicz (United States)
Steven Freeland (Australia)
Ram Jakhu (Canada)
Anatoly Y. Kapustin (Russia)
Toshio Kosuge (Japan)
Francis Lyall (United Kingdom)
Sergio Marchisio (Italy)
José Monserrat Filho (Brazil)
K.R. Sridhara Murthi (India)
Sylvia Ospina (Colombia/United States)
Sang-Myon Rhee (Korea)
Kai-Uwe Schrogl (Germany)
Maureen Williams (Argentina)
Haifeng Zhao (China)

Presidents Emeriti

I.H.Ph. Diederiks-Verschoor (The Netherlands)
N. Jasentuliyana (Sri Lanka)

Honorary Directors

Karl-Heinz Böckstiegel (Germany)
Michel Bourély (France)
Aldo Armando Cocca (Argentina)
Stephen E. Doyle (United States)
Ernst Fasan (Austria)
Gyula Gal (Hungary)
Peter Jankowitsch (Austria)
Gabriel Lafferranderie (France)
Nicolas Mateesco Matte (Canada)
Priyatna Abdurrasyid (Indonesia)
Patricia M. Sterns (United States)
Vladlen S. Vereshchetin (Russia)
Eugeniusz Wyzner (Poland)
Gennady P. Zhukov (Russia)

Introduction to the Technical Programme

Based on recent experiences of the IAC, the Naples technical programme promises to be one of the most varied and detailed ever.

The IAF Technical Committees, the IAA Commissions and the IISL Programme Committees contain some of the world's best-recognised experts in their fields. These bodies will independently or jointly discuss, propose and run Symposia, with the International Programme Committee making the final choice of papers for the 63rd IAC.

The technical programme for 2012 Congress is shown below. All Symposia are grouped into four categories, A. Science and Exploration, B. Applications and Operations, C. Technology, D. Infrastructure and E. Space and Society, so that it should be easy for everybody to find where to go. You are highly encouraged to submit abstracts for the Congress to be held in the wonderful city of Naples!

Tetsuo Yasaka
IAF Vice President, Technical Activities

Category A

SCIENCE AND EXPLORATION

Systems sustaining missions, including life, microgravity, space exploration, space debris and SETI

A1 SPACE LIFE SCIENCES SYMPOSIUM
A2 MICROGRAVITY SCIENCES AND PROCESSES
A3 SPACE EXPLORATION SYMPOSIUM
A4 40TH SYMPOSIUM ON THE SEARCH FOR EXTRATERRESTRIAL INTELLIGENCE (SETI) – THE NEXT STEPS
A5 HUMAN EXPLORATION OF THE MOON AND MARS SYMPOSIUM
A6 SPACE DEBRIS SYMPOSIUM
A7 SPACE ASTRONOMY SYMPOSIUM

Category coordinated by Marcus Dejmek, Canadian Space Agency - CANADA

A1 SPACE LIFE SCIENCES SYMPOSIUM

The symposium jointly organised by the International Academy of Astronautics and the International Astronautical Federation addresses all aspects of space life sciences research and practice in human and robotic spaceflight, from Low Earth Orbit (LEO) to the universe beyond, and from the Big Bang to the lives of future explorers on other planets of our solar system.

Coordinator

Ronald J. White
South Dakota School of Mines & Technology — UNITED STATES

Oleg Orlov
Institute for Biomedical Problems — RUSSIA

A1.1 Behaviour, Performance and Psychosocial Issues in Space

This session considers psychosocial, interpersonal, cultural, cognitive, circadian/sleep and human factors issues and countermeasures related to human spaceflight and space exploration.

Co-Chair

Nick Kanas
University of California and Veterans Affairs Medical Center — UNITED STATES

Gro M. Sandal
University of Bergen — NORWAY

Rapporteur

Vadim Gushin
Institute for Biomedical Problems — RUSSIA

A1.2 Human Physiology in Space

This session focuses on all aspects of spaceflight physiology that relate to human health and to the countermeasures employed to maintain health and performance.

Co-Chair

Inessa Kozlovskaya
Institute for Biomedical Problems — RUSSIA

Satoshi Iwase
Aichi Medical University — JAPAN

Rapporteur

Patrik Sundblad
European Space Agency (ESA) — THE NETHERLANDS

A1.3 Medical Care for Humans in Space

The session focuses on medical care for astronauts including operational medicine aspects, countermeasure development and applications as well as needs for future care for astronauts during long term stays in space and missions to and on the Moon and Mars. A further focus will lie on medical care for passengers and operators of commercial suborbital and orbital space flights.

Co-Chair

Anatoly I. Grigoriev
Russian Academy of Sciences — RUSSIA

Jeffrey R. Davis
National Aeronautics and Space Administration (NASA)/Johnson Space Center — UNITED STATES

Rapporteur

Peter Graef
Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR) — GERMANY

A1.4 Radiation Fields, Effects and Risks in Human Space Missions

The major topics of this session are the characterisation of the radiation environment by theoretical modelling and experimental data, radiation effects on physical and biological systems, countermeasures to radiation and radiation risk assessment.

Co-Chair

Günther Reitz
Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR) — GERMANY

Giovanni De Angelis
SERCO S.p.A — ITALY

Rapporteur

Nicole Buckley
Canadian Space Agency — CANADA

A1.5 Astrobiology and Exploration

Astrobiology plays a key role in the preparation of space exploration endeavors to find life in our solar system and beyond. Investigating habitability constraints and instrument technology to search for organic compounds and life provides support to current and future robotic missions to inner and outer solar system bodies as well as human exploration missions targeting the Earth-Moon-Mars space. The session invites papers of astrobiological content supporting space exploration.

Co-Chair

Petra Rettberg
Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR) — GERMANY

Pascale Ehrenfreund
Space Policy Institute, George Washington University — UNITED STATES

Rapporteur

Inge ten Kate
National Aeronautics and Space Administration (NASA)/Goddard Space Flight Center — UNITED STATES

A1.6 Life Support and EVA Systems

This session will address strategies, solutions and technologies in providing for human requirements during future deep space and planetary/lunar surface exploration.

Co-Chair

Chiaki Mukai
Japan Aerospace Exploration Agency (JAXA) — JAPAN

Bernhard Koch
Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR) — GERMANY

Rapporteur

Terrence G. Reese
National Aeronautics and Space Administration (NASA) — UNITED STATES

A1.7 Biology in Space

This session focuses on all aspects of biology and biological systems related to gravity in groundbased and space flight experiments as well as on topics not covered by other sessions of this symposium.

Co-Chair

Catharine Conley
National Aeronautics and Space Administration (NASA) — UNITED STATES

Marlene Grenon
University of California, San Francisco — UNITED STATES

Rapporteur

Fengyuan Zhuang
Beihang University — CHINA

A1.8 Private Human Spaceflight

This session focusses on medical aspects of crew and passengers of commercial suborbital and orbital spaceflight as well as on future life sciences research opportunities in private human spaceflight.

Co-Chair

Rupert Gerzer
Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR) — GERMANY

Melchor Antunano
U.S. Federal Aviation Administration (FAA) — UNITED STATES

Rapporteur

Volker Damann
Space Applications Services N.V. — GERMANY

A2 MICROGRAVITY SCIENCES AND PROCESSES SYMPOSIUM

The objective of the Microgravity Science and Processes Symposium is to highlight and discuss the state of the art in microgravity (reduced-gravity) physical sciences and processes, as well as to prepare for future orbital infrastructure. Session topics cover all microgravity science disciplines (material science, fluid physics, combustion science, fundamental physics), current results and research perspectives, together with relevant technology developments.

Coordinator

Antonio Viviani
Seconda Universita' di Napoli — ITALY

Marcus Dejmek
Canadian Space Agency — CANADA

A2.1 Gravity and Fundamental Physics

This session is devoted to the search of new fields of research in condensed matter physics and gravitational physics including cryogenic fluids, critical fluids, equivalence principle, atomic clock, and plasma crystals.

Co-Chair

Francois Gonzalez
Centre National d'Etudes Spatiales (CNES) — FRANCE

Joachim Richter
RWTH Aachen — GERMANY

Rapporteur

Qi KANG
National Microgravity Laboratory, Institute of Mechanics, Chinese Academy of Sciences. —CHINA

A2.2 Fluid and Materials Sciences

The main focus of the session is on perspective research fields in fluid and materials sciences, multi-phase and chemically reacting flows including theoretical modelling, numerical simulations, and results of pathfinder laboratory and space experiments.

Co-Chair

Raimondo Fortezza
Telespazio — ITALY

Nickolay N. Smirnov
Moscow Lomonosov State University — RUSSIA

Rapporteur

Jean-Claude Legros
Université Libre de Bruxelles — BELGIUM

A2.3 Microgravity Experiments from Sub-Orbital to Orbital Platforms

This session presents recent results of microgravity experiments from all disciplines using different microgravity platforms, including drop towers, parabolic aircrafts, sounding rockets and capsules.

Co-Chair

Ziad Saghir
Ryerson University — CANADA

Raffaele Savino
University of Naples «Federico II» — ITALY

Rapporteur

Vladimir Pletser
European Space Agency (ESA) — THE NETHERLANDS

A2.4 Science Results from Ground Based Research

This session is focused on the results of ground based preparatory experiments from all disciplines.

Co-Chair

Valentina Shevtsova
Université Libre de Bruxelles — BELGIUM

Antonio Viviani
Seconda Universita' di Napoli — ITALY

Rapporteur

Nickolay N. Smirnov
Moscow Lomonosov State University — RUSSIA

A2.5 Facilities and Operations of Microgravity Experiments

This session is devoted to new diagnosis developments, new instruments definition and concepts for the future, as well as ground and flight operation (telescience, robotics, hardware & software).

Co-Chair

Marcus Dejmek
Canadian Space Agency — CANADA

Rainer Willnecker
Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR) — GERMANY

Rapporteur

Peter Hofmann
Kayser-Threde GmbH — GERMANY

A2.6 Microgravity Sciences Onboard the International Space Station and Beyond

Aimed to the presentation of results obtained from large orbital platforms, in particular the ISS, as well as preparation scenarios for further long term flight opportunities. The session includes description and performance of ground and in-orbit infrastructures.

Co-Chair

Jules Kenol
National Aeronautics and Space Administration (NASA)/Johnson Space Center — UNITED STATES

Bernard Zappoli
Centre National d'Etudes Spatiales (CNES) — FRANCE

Rapporteur

Christoph Pütz
Astrium Space Transportation — GERMANY

A2.7 Microgravity Processes Onboard Large Space Platforms

The session is aimed to the presentation of applications on the ISS and other large orbital platforms, including accommodations of facilities and experiments as well as science planning, operational scenarios and simulations.

Co-Chair

Peter Hofmann
Kayser-Threde GmbH — GERMANY

Christoph Pütz
Astrium Space Transportation — GERMANY

Rapporteur

Gabriel Pont
Centre National d'Etudes Spatiales (CNES) — FRANCE

A3 SPACE EXPLORATION SYMPOSIUM

This symposium covers the current and future robotic missions and material plans for initiatives in the exploration of the Solar System.

Coordinator

Christian Sallaberger
MDA Corporation — CANADA

Bernard Foing
European Space Agency (ESA) — THE NETHERLANDS

A3.1 Space Exploration Overview

This session covers Space Exploration strategies and architectures, as well as technology roadmaps. Papers of both national and international perspectives are invited, as are papers dealing with the emerging area of commercial space exploration activities.

Co-Chair

Christian Sallaberger
MDA Corporation — CANADA

Luc Frécon
Thales Alenia Space France — FRANCE

Rapporteur

Piero Messina
European Space Agency (ESA) — THE NETHERLANDS

Eun-Sup Sim
Korea Aerospace Research Institute — KOREA, REPUBLIC OF

A3.2A Moon Exploration – Part 1

This session will address current and future lunar missions. The session will address orbital missions, robotic surface missions, as well as life sciences on the Moon, resource utilisation and preparatory activities for future solar system exploration.

Co-Chair

Bernard Foing
European Space Agency (ESA) — THE NETHERLANDS

David Korsmeyer
National Aeronautics and Space Administration (NASA) — UNITED STATES

Rapporteur

William H. Siegfried
The Boeing Company — UNITED STATES

Sylvie Espinasse
European Space Agency (ESA) — THE NETHERLANDS

A3.2B Moon Exploration – Part 2

This session will address current and future lunar missions. The session will address orbital missions, robotic surface missions, as well as life sciences on the Moon, resource utilisation and preparatory activities for future solar system exploration.

Co-Chair

Bernard Foing
European Space Agency (ESA) — THE NETHERLANDS

David Korsmeyer
National Aeronautics and Space Administration (NASA) — UNITED STATES

Rapporteur

William H. Siegfried
The Boeing Company — UNITED STATES

Sylvie Espinasse
European Space Agency (ESA) — THE NETHERLANDS

A3.3A Mars Exploration – Part 1

The planet Mars is being explored now and in the coming years with multiple robotic missions from a variety of nations. This session will cover current results from ongoing Mars missions and the designs for proposed Mars missions including expected experiments. Papers on any aspects of the search for evidence of extant or extinct Martian life, and forward and backward contamination are particularly welcome.

Co-Chair

Vincenzo Giorgio
Thales Alenia Space Italia — ITALY

Pierre W. Bousquet
Centre National d'Etudes Spatiales (CNES) — FRANCE

Rapporteur

Cheryl Reed
The John Hopkins University Applied Physics Laboratory — UNITED STATES

Amalia Ercoli Finzi
Politecnico di Milano — ITALY

A3.3B Mars Exploration – Part 2

The planet Mars is being explored now and in the coming years with multiple robotic missions from a variety of nations. This session will cover current results from ongoing Mars missions and the designs for proposed Mars missions including expected experiments. Papers on any aspects of the search for evidence of extant or extinct Martian life, and forward and backward contamination are particularly welcome.

Co-Chair

Vincenzo Giorgio
Thales Alenia Space Italia — ITALY

Pierre W. Bousquet
Centre National d'Etudes Spatiales (CNES) — FRANCE

Rapporteur

Cheryl Reed
The John Hopkins University Applied Physics Laboratory — UNITED STATES

Amalia Ercoli Finzi
Politecnico di Milano — ITALY

A3.4 Small Bodies Missions and Technologies

This session will present the missions and technological aspects related to the exploration of small bodies including a search for pre-biotic signatures.

Co-Chair

Susan McKenna-Lawlor
Space Technology (Ireland) Ltd. — IRELAND

Stephan Ulamec
Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR) — GERMANY

Rapporteur

Marc D. Rayman
Jet Propulsion Laboratory - California Institute of Technology — UNITED STATES

Norbert Frischauf
ORF — AUSTRIA

A3.5 Solar System Exploration

This session covers robotic missions for Solar System exploration (inner and outer planets and their satellites, and space plasma physics) except the Earth, Moon, Mars, and small bodies covered in other sessions of this symposium. Papers covering both new mission concepts as well as the associated specific technologies are invited.

Co-Chair

Junichiro Kawaguchi
Japan Aerospace Exploration Agency (JAXA) — JAPAN

Mariella Graziano
GMV — SPAIN

Rapporteur

William H. Siegfried
The Boeing Company — UNITED STATES

A4 41st SYMPOSIUM ON THE SEARCH FOR EXTRATERRESTRIAL INTELLIGENCE (SETI) – The Next Steps

This symposium organised by the IAA deals with the scientific, technical and interdisciplinary aspects of the search for extra-terrestrial intelligence (SETI) including a discussion of all kinds of contacts. The technical side is not limited to the microwave window, but includes also optical and any kinds of radiation. The interdisciplinary aspects include all societal implications, risk communication and philosophical considerations of any kind of discovery or contact.

Coordinator

Seth Shostak
SETI Institute — UNITED STATES

Claudio Maccone
International Academy of Astronautics (IAA) — ITALY

A4.1 SETI 1: SETI Science and Technology

All technical aspects involved in the search for extraterrestrial intelligence, including current and future search strategies.

Co-Chair

Lori Walton
Tigerstar Geoscience — CANADA

Stelio Montebugnoli
National Institute for Astrophysics — ITALY

Rapporteur

Douglas Vakoch
SETI Institute and California Institute of Integral Studies — UNITED STATES

A4.2 SETI 2: SETI and Society

All aspects concerning the societal implications of extraterrestrial intelligence are considered, including public reaction to a discovery.

Co-Chair

Paolo Musso
University of Insubria — ITALY

Richard Clar
Art Technologies — FRANCE

Rapporteur

H. Paul Shuch
The SETI League, Inc. — UNITED STATES

A5 HUMAN EXPLORATION OF THE SOLAR SYSTEM SYMPOSIUM

This symposium covers the strategic plans, architectural concepts and technology development for future human exploration of the Solar System.

Coordinator

Christian Sallaberger
MDA Corporation — CANADA

Wendell Mendell
National Aeronautics and Space Administration (NASA) — UNITED STATES

A5.1 Near Term Strategies for Lunar Surface Infrastructure

This session will look at the study of lunar surface infrastructure elements to support human exploration from a lunar outpost or sortie missions. Papers are invited to discuss technology roadmaps as well as interfaces to allow international cooperation and lunar surface activies.

Co-Chair

Maria Antonietta Perino
Thales Alenia Space Italia — ITALY

Wendell Mendell
National Aeronautics and Space Administration (NASA) — UNITED STATES

Rapporteur

Nadeem Ghafoor
MDA — CANADA

A5.2 Long Term Scenarios for Human Moon/Mars Presence

Many studies of human Moon and Mars missions have been conducted in the 35 years since the first Apollo Moon landing. Utilisation and colonization of the Moon and Mars will require that a long term, sustainable strategy be developed - and followed. In addition, future lunar and Mars enterprise must be considered as part of an evolving space infrastructure that can utilise the goods and services stemming from colonies to enhance or enable ever more ambitious human and robotic space exploration goals. This session will address strategic aspects of political, philosophical, legal and commercial «enablers», including technological road maps and benefits to humanity that might result from human exploration and ultimately colonization. A goal of the session is the advancement of a strategy leading toward self-supporting colonies.

Co-Chair

William H. Siegfried
The Boeing Company — UNITED STATES

Uwe Apel
Hochschule Bremen — GERMANY

Rapporteur

Nadeem Ghafoor
MDA — CANADA

A5.3 / B3.6 Joint Session on Human and Robotic Partnerships to Realize Space Exploration Goals

This session seeks papers on new systems and technologies for future human solar system exploration missions, and the role of human and robotic partnerships in areas such as human surface mobility systems (rovers); habitat/infrastructure construction; robotic assistants; and, precursor activities such as sample returns, in-situ plant growth and food and fuel production demonstrations. This session also welcomes papers considering how the roles of humans, machines and intelligent systems are likely to evolve in the coming years and the corresponding impact on complex mission design, implementation, and operations.

Co-Chair

Christian Sallaberger
MDA Corporation — CANADA

Anthony R. Gross
National Aeronautics and Space Administration (NASA) — UNITED STATES

Rapporteur

M. Hempsell
The British Interplanetary Society — UNITED KINGDOM

Alexandra Kindrat
International Space University (ISU) — CANADA

A5.4 Going Beyond the Earth-Moon System: Human Missions to Mars, Libration Points, and NEO's

This session will explore short duration human missions to destinations beyond the Earth Moon system. Papers are invited to discuss program architectures and technology roadmaps as well as the issues of scientific and political motivations and international cooperation.

Co-Chair

Ernst Messerschmid
University of Stuttgart — GERMANY

Genevieve Gargir
Centre National d'Etudes Spatiales (CNES) — FRANCE

Rapporteur

Gerhard Schwehm
European Space Agency (ESA) — SPAIN

A6 SPACE DEBRIS SYMPOSIUM

The symposium will address the complete spectrum of technical issues of space debris: measurements, modelling, risk assessment in space and on the ground, reentry, hypervelocity impacts and protection, mitigation and standards, and Space Surveillance.

Coordinator

Nicholas L. Johnson
National Aeronautics and Space Administration (NASA) — UNITED STATES

Christophe Bonnal
Centre National d'Etudes Spatiales (CNES) — FRANCE

A6.1 Measurements

This session will address advanced ground and space-based measurement techniques, relating processing methods, and results on the derived spatial and temporal distribution of debris.

Co-Chair

Patrick Seitzer
University of Michigan — UNITED STATES

Vladimir Agapov
Keldysh Institute of Applied Mathematics, RAS — RUSSIA

Rapporteur

Thomas Schildknecht
Astronomical Institute University of Bern (AIUB) — SWITZERLAND

A6.2 Modelling and Risk Analysis

This session will address the characterisation of the current and future debris population and methods for in-orbit and on-ground risk assessments. The in-orbit analysis will cover collision risk estimates based on statistical population models and deterministic catalogues, and active avoidance.

Co-Chair

Luciano Anselmo
ISTI-CNR — ITALY

Carsten Wiedemann
Technical University of Braunschweig — GERMANY

Rapporteur

Toshiya Hanada
Kyushu University — JAPAN

A6.3 Hypervelocity Impacts and Protection

The session will address passive protection, shielding and damage predictions. Shielding aspects will be supported by experimental and computational results of HVI tests. Use of HVI techniques for debris mitigation.

Co-Chair

James Hyde
Barrios Technology/ESC Group - NASA — UNITED STATES

Alessandro Francesconi
University of Padova — ITALY

Rapporteur

Frank Schaefer
Fraunhofer - Institut für Kurzzeitdynamik, Ernst-Mach-Institut (EMI) — GERMANY

A6.4 Mitigation and Standards

This session will focus on the definition and implementation of debris prevention and reduction measures and vehicle passive protection. The session will also address space debris mitigation guidelines and standards that already exist or are in preparation at the national or international level.

Co-Chair

Fernand Alby
Centre National d'Etudes Spatiales (CNES) — FRANCE

John W. Hussey
UNITED STATES

Rapporteur

Akira Kato
Japan Aerospace Exploration Agency (JAXA) — JAPAN

A6.5 Space Debris Removal Issues

This session will address active removal techniques «ground and space based».

Co-Chair

Heiner Klinkrad
European Space Agency (ESA) — GERMANY

Darren McKnight
Integrity Applications Incorporated (IAI) — UNITED STATES

Rapporteur

Seishiro Kibe
Japan Aerospace Exploration Agency (JAXA) — JAPAN

A6.6 Political, Economic and Institutional Aspects of Space Debris Mitigation and Removal (Joint with Space Security Committee)

This session will deal with the non-technical aspect of space debris mitigation and removal. Economic issues including financial benefit and insurance, political aspects such as the role of UNCOPUOS are important issues to pass in the future. The role of international cooperation in addressing these issues will be considered.

Co-Chair

Kazuto Suzuki
Hokkaido University — JAPAN

Holger Krag
European Space Agency (ESA) — GERMANY

Rapporteur

Michael Yakovlev
Central Research Institute of Machine Building (FSUE/TSNIIMASH) — RUSSIA

Charlotte Mathieu
European Space Agency (ESA) — FRANCE

Category B

APPLICATIONS AND OPERATIONS

On-going and future operational applications, including Earth observation, communication, navigation, human space endeavours and small satellites

B1 EARTH OBSERVATION SYMPOSIUM
B2 SPACE COMMUNICATIONS AND NAVIGATION
B3 HUMAN SPACE ENDEAVOURS
B4 SMALL SATELLITE MISSIONS
B5 SYMPOSIUM ON INTEGRATED APPLICATIONS
B6 SPACE OPERATIONS SYMPOSIUM

Category coordinated by Denis J.P. Moura, European Defence Agency - BELGIUM

B1 EARTH OBSERVATION SYMPOSIUM

This symposium focuses on space missions which deal with collecting information about the Earth and its environment. Session topics deal with all aspects of Earth Observation missions including the policy and infrastructure of international cooperation and coordination, the emergence of commercial systems to satisfy market needs, the technical descriptions of new missions and sensors to be used, data processing and GIS, environmental applications and global change studies and the use of space-based technologies.

Coordinator

John W. Hussey
UNITED STATES

Pierre Ranzoli
Eumetsat — GERMANY

B1.1 International Cooperation in Earth Observation Missions

Focus is on efforts being made by governments, agencies and society to achieve coordination, cooperation and compatibility in the development of space-based Earth observation systems. Presentations are encouraged which involve cooperative efforts with developing countries. Papers on current and ongoing missions involving coordination among commercial, government and other entities are especially encouraged.

Co-Chair

John W. Hussey
Consultant — UNITED STATES

Pierre Ranzoli
Eumetsat — GERMANY

Rapporteur

David Brent Smith
National Oceanic and Atmospheric Administration (NOAA) — UNITED STATES

B1.2 Future Earth Observation Systems

Emphasis is on technical descriptions of planned and new space systems and missions for experimental and operational Earth observation. Descriptions of new concepts and innovative Earth observation systems are encouraged.

Co-Chair

Benoit Boissin
Centre National d'Etudes Spatiales (CNES) — FRANCE

Gilles Corlay
EADS Sodern — FRANCE

Rapporteur

Gunter Schreier
Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR) — GERMANY

B1.3 Earth Observation Sensors and Technology

Focus is on sensors now being developed or tested for all aspects of Earth observation. Particular emphasis is on new sensors for meeting the growing demand of user markets.

Co-Chair

Andrew Court
TNO — THE NETHERLANDS

Yean Joo Chong
National University of Singapore — REP. OF SINGAPORE

Rapporteur

Luigi Bussolino
Bussolino and Associates — ITALY

B1.4 Earth Observation Data Management Systems

Earth Observation Data Acquisition, Communication, Processing, Dissemination and Archiving.

Co-Chair

Bruce K. Quirk
U.S. Geological Survey — UNITED STATES

Carlo Ulivieri
University of Rome «La Sapienza» — ITALY

Rapporteur

Pierre Ranzoli
Eumetsat — GERMANY

B1.5 Earth Observation Applications and Economic Benefits

Earth Observation value-added products.

Co-Chair

Luigi Bussolino
Bussolino and Associates — ITALY

Paul Kamoun
Thales Alenia Space France — FRANCE

Rapporteur

Yean Joo Chong
National University of Singapore — REP. OF SINGAPORE

B1.6 Dual Use Earth Observation

Focus on the dual use (civilian and military) aspects of Earth Observation missions at the programmatic, organisational and technical levels.

Co-Chair

Jan Kolar
Czech Space Office — CZECH REPUBLIC

Denis J.P. Moura
European Defence Agency — BELGIUM

Rapporteur

David Brent Smith
National Oceanic and Atmospheric Administration (NOAA) — UNITED STATES

B2 SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM

This symposium examines development in technology, applications and systems as they relate to fixed and mobile communication services, satellite broadcasting, position determination, navigation and timing, and interactive multimedia provisioning.

Coordinator

Joe M. Straus
The Aerospace Corporation — UNITED STATES

Otto Koudelka
Graz University of Technology and Joanneum Research — AUSTRIA

B2.1 Near-Earth and Interplanetary Communications

Systems with relative motion between space and ground segments, in both near-earth and interplanetary environments, will be discussed, with particular emphasis on unique concepts, techniques, and technologies.

Co-Chair

Manfred Wittig
European Space Agency (ESA) — THE NETHERLANDS

Ramon P. De Paula
National Aeronautics and Space Administration (NASA) — UNITED STATES

Rapporteur

A. Bhaskaranarayana
Indian Space Research Organization (ISRO) — INDIA

B2.2 Advanced Technologies

Future promising space communication and navigation technologies will be presented, as applied to existing and developing systems.

Co-Chair

Edward W. Ashford
Ashford Aerospace Consulting — UNITED STATES

M.G. Chandrasekhar
Devas Multimedia Pvt. Ltd. — UNITED STATES

Rapporteur

Elemer Bertenyi
E. Bertenyi & Associates Inc. — CANADA

B2.3 Advanced Systems

Advanced satellite communications and applications will be presented.

Co-Chair

Robert Prevaux
Space Systems/Loral — UNITED STATES

Ryutaro Suzuki
National Institute of Information and Communications Technology — JAPAN

Rapporteur

Morio Toyoshima
National Institute of Information and Communications Technology — JAPAN

B2.4 Fixed and Broadcast Communications

Advances in fixed and broadcast systems will be presented, including Ka band operation and radio/television direct-to-user applications.

Co-Chair

Otto Koudelka
Graz University of Technology and Joanneum Research — AUSTRIA

Desaraju Venugopal
Devas Multimedia Pvt. Ltd. — INDIA

Rapporteur

Moon-Beom Heo
Korea Aerospace Research Institute — KOREA, REPUBLIC OF

B2.5 Mobile Satellite Communications and Navigation Technology

New and emerging technologies for mobile and personal satellite communications and navigation will be presented.

Co-Chair

Robert Briskman
Sirius XM Radio — UNITED STATES

Jean-Paul Aguttes
Centre National d'Etudes Spatiales (CNES) — FRANCE

Rapporteur

Kevin Shortt
Canadian Space Society — CANADA

B2.6 Space-Based Navigation Systems and Services

New and emerging systems for satellite-based position, navigation and timing will be presented, including end-user applications.

Co-Chair

Rita Lollock
The Aerospace Corporation — UNITED STATES

Cédric Balty
Thales Alenia Space France — FRANCE

Rapporteur

Dipak Srinivasan
The John Hopkins University Applied Physics Laboratory — UNITED STATES

B3 HUMAN SPACE ENDEAVOURS SYMPOSIUM

The symposium addresses all aspects of human space endeavours including the design, development, operations, utilisation and future plans of space missions involving humans. The scope covers past, present and future space endeavours.

Coordinator

John Uri
National Aeronautics and Space Administration (NASA)/Johnson Space Center — UNITED STATES

Carlo Mirra
EADS Astrium — THE NETHERLANDS

B3.1 Overview Session (Present and Near-Term Human Space Flight Programmes)

The session provides the forum for «Overview» papers and presentations on present and evolving Human Space programmes in and beyond Low Earth Orbit. It is anticipated that this session will include the current status of the International Space Station, the future plans of those nations with an autonomous or evolving human space flight programme and the spacecraft being developed to support them, and other human space flight programmes including those under development as commercial ventures. Technical papers to be presented are expected to portray the latest development of these programmes.

Co-Chair

Carlo Mirra
EADS Astrium — THE NETHERLANDS

John Uri
National Aeronautics and Space Administration (NASA)/Johnson Space Center — UNITED STATES

Rapporteur

Rainer Willnecker
Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR) — GERMANY

B3.2 How Can We Best Apply Our Experience to Future Human Missions?

This session shall provide a forum for the exchange of the experience of previous human space flight missions like Apollo, Skylab, Soyuz, Salyut, Mir, Space Shuttle and ISS, and provide insight into how this information can be best used for designing future missions. Technical papers to be presented are expected to show the direct relationship between past missions and their potential influence on newly designed missions. Special attention will be given to cost reduction efforts with enhanced crew and vehicle safety.

Co-Chair

Dieter Sabath
Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR) — GERMANY

Sergey K. Shaevich
Khrunichev State Research & Production Space Center — RUSSIA

Rapporteur

Gene Rice
RWI - Rice Wigbels Int'l — UNITED STATES

B3.3 ISS Utilisation

This session will address utilisation of the International Space Station, providing the opportunity to discuss achievements, plans and outlook of ISS utilisation. Topics for discussion include payloads, experiments, research, manufacturing, and other on-orbit activity and its related planning and operations. Scientific and industrial utilisation applications and engineering research and technology demonstrations, as well as uses of ISS as test bed for exploration are appropriate items of discussion. Included are discussions of utilisation accommodations, and new or proposed facilities or elements, as well as future uses of the ISS.

Co-Chair

Maria Stella Lavitola
Thales Alenia Space Italia — ITALY

Kevin Foley
The Boeing Company — UNITED STATES

Rapporteur

Shannon Ryan
Defence Science and Technology Organisation (DSTO) — AUSTRALIA

B3.4 B6.5 Sustainable Operation of the ISS - Joint Session of the Human Space Endeavours and Space Operations Symposia

This session will address key challenges and their solutions related to operations of the International Space Station as an integrated facility, its systems and its elements. Topics to be discussed include recent operational problems and solutions, cost reduction for affordability, new and proposed facilities or elements, and ground segment operations and planning. Also included would be topics such as logistics and logistics planning, transportation, sustainment, and the geopolitical value as a tool for promoting international cooperation.

Co-Chair

Maria Stella Lavitola
Thales Alenia Space Italia — ITALY
NAPLES 2012

Helmut Luttmann
Astrium Space Transportation — GERMANY

Bob Chesson
European Space Agency (ESA) — THE NETHERLANDS

Rapporteur

Rachid Amekrane
Astrium GmbH — GERMANY

B3.5 Astronauts: Those Who Make It Happen

This session is designed to review and discuss issues related to a key element of human missions: the Astronauts. Papers are solicited covering topics such as how to select astronauts, astronaut safety, decision making process during space flight, actions at contingency situations onboard, functional roles and responsibilities of crewmembers and Mission Control Center, physical and cognitive impacts of long duration space flight, extravehicular activity and space vehicle maintenance, astronaut as a researcher and testpilot in space, design and utilisations of suits and tools, recreation and entertainment in weightlessness, astronauts' roles and challenges in surface operations (Moon, Mars and other planets), astronauts' involvement in space programme development (DDT&E), and considerations for the international nature of crews.

Co-Chair

Igor V. Sorokin
S.P. Korolev Rocket and Space Corporation Energia — RUSSIA

Alan T. DeLuna —
UNITED STATES

Rapporteur

Tai Nakamura
Japan Aerospace Exploration Agency (JAXA) — JAPAN

B3.6 A5.3 Joint Session on Human and Robotic Partnerships to Realise Space Exploration Goals

This session seeks papers on new systems and technologies for future human solar system exploration missions, and the role of human and robotic partnerships in areas such as human surface mobility systems (rovers); habitat/infrastructure construction; robotic assistants; and precursor activities such as sample returns, in-situ plant growth and food and fuel production demonstrations. This session also welcomes papers considering how the roles of humans, machines and intelligent systems are likely to evolve in the coming years and the corresponding impact on complex mission design, implementation, and operations.

Co-Chair

Anthony R. Gross
National Aeronautics and Space Administration (NASA) — UNITED STATES

Christian Sallaberger
MDA Corporation — CANADA

Rapporteur

M. Hempsell
The British Interplanetary Society — UNITED KINGDOM

Alexandra Kindrat
International Space University (ISU) — CANADA

B3.7 New Technologies, Processes and Operating Modes Enabling Future Human Missions

This session is designed to examine the potential evolution of key elements of future human missions, especially those driven by affordability and sustainability requirements. Papers are solicited that address how to shape the future of technologies, logistics, processes, procedures, etc. to enable future human space mission objectives that will include exploration, commercial initiatives, tourism, and industrial processes.

Co-Chair

Martin Zell
European Space Agency (ESA) — THE NETHERLANDS

Lionel Suchet
Centre National d'Etudes Spatiales (CNES) — FRANCE

Rapporteur

Gi-Hyuk Choi
Korean Aerospace Research Institute — KOREA, REPUBLIC OF

B3.8 E7.7 Joint IAF/IISL Session on Policy and Law of Human Space Missions

This session hosts papers on topics related to the political and legal aspects of international collaboration in future human space missions and programmes such as the ISS lifetime extension, post ISS activities in LEO or the Lunar Exploration. The session provides a forum to discuss the de jure regulatory framework and de facto implementation of such programmes during the development and operation phases. In addition, the session will address effects of extending the duration and partnership of the ISS programme and lessons learned from past collaborative programmes such as Interkosmos or the Shuttle-Spacelab programmes may be addressed.

Co-Chair

Cristian Bank
EADS Astrium Space Transportation GmbH — GERMANY

Lesley Jane Smith
Leuphana University of Lüneburg/ Weber-Steinhaus & Smith — GERMANY

Rapporteur

Luise Weber-Steinhaus
Astrium Space Transportation — GERMANY

B4 16TH SYMPOSIUM ON SMALL SATELLITE MISSIONS

«Small Satellite Missions» refers to the class of missions conducted using satellites weighing less than 1000 kg. For clarity, we further classify small satellites as microsats if they weigh less than 100 kg; nanosats if they weigh less than 10 kg; and pico or cubesats if they weigh less than1 kg.
This symposium, organised by the International Academy of Astronautics (IAA), addresses small satellite missions and projects in science, exploration, and technology for government, industry, and academic programmes.

The symposium scope encompasses space science (B4.2), earth observation (B4.4), and exploration (B4.8) missions, as well as the cross-cutting topics of small satellite programmes in developing countries (B4.1), cost-effective operations (B4.3), affordable and reliable space access (B4.5), emerging and promising technologies (B4.6A and B4.6B), and cross-platform compatibility applications and standards (B4.7A). For IAC 2012, the symposium is introducing the topic of Small Distributed Space Missions (B4.7B), to be held in cooperation with B4.7A as a possible implementation of modular, reconfigurable, rapid systems. This symposium will be accepting submissions for oral presentations only.

Coordinator

Rhoda Shaller Hornstein
National Aeronautics and Space Administration (NASA) — UNITED STATES

Alex da Silva Curiel
Surrey Satellite Technology Ltd — UNITED KINGDOM

B4.1 13th UN/IAA Workshop on Small Satellite Programmes at the Service of Developing Countries

This workshop is organised jointly by the United Nations Office for Outer Space Affairs (UN/OOSA) and the International Academy of Astronautics (IAA). It shall review the needs that could be satisfied and results achieved by developing nations through the use of small satellites. National space plans and examples of application results and benefits shall be included. The workshop shall also review benefits of international cooperation and transferring technology and lessons learned from space developing countries.

Co-Chair

Sias Mostert
Space Commercial Services — SOUTH AFRICA

Sergei Chernikov
United Nations Office at Vienna — AUSTRIA

Rapporteur

Petr Lala
Czech Space Office — CZECH REPUBLIC

Pierre Molette —
FRANCE

B4.2 Small Space Science Missions

This session will address the current and near-term approved small/micro/nano missions whose objective is to achieve returns in the fields of Earth science, solar, interplanetary, planetary, astronomy/astrophysics observations, and fundamental physics. Emphasis will be given to results achieved, new technologies and concepts, and novel management techniques.

Co-Chair

Stamatios Krimigis
The John Hopkins University — UNITED STATES

Denis J.P. Moura
European Defence Agency — BELGIUM

B4.3 Small Satellite Operations

This session covers the planning for, and execution of, cost-effective approaches for Small Satellite Operations, with emphasis on new missions with new models of operation to reduce mission lifecycle costs and to minimize the cost impact of mission extensions. Papers addressing innovation, an entrepreneurial approach to new business opportunities, novel finance and business models, management techniques, and international cooperation in support of Small Satellite Operations are particularly encouraged. Papers that discuss the application of novel technology to mission operations, such as automation and autonomy, constraint resolution, and timeline planning, as well as reports on missions recently accomplished and lessons learned, are also welcome.
For papers not addressing small satellites, please refer to symposium B6.

Co-Chair

Peter M. Allan
Rutherford Appleton Laboratory — UNITED KINGDOM

Karen McBride
University of California, Los Angeles — UNITED STATES

B4.4 Small Earth Observation Missions

We call for papers that will present information to decision makers, scientists, engineers, and managers about cost-effective small satellite missions, instruments, technologies, and designs of both current and planned Earth- and near-Earth missions. This session addresses the technologies, applications and missions achieved through the use of small, cost-effective satellites to observe the Earth and near-Earth space. Innovative cost-effective solutions to the needs of the science and applications communities are sought. Satellite technologies suited for use on small satellites including those in the single to multiple cubesat range are particularly encouraged. Satellite or technology development efforts that use of innovative launch opportunities such as the developing space tourism market hold significant promise: papers addressing these evolving opportunities would be welcomed.

Co-Chair

Larry Paxton
The John Hopkins University Applied Physics Laboratory — UNITED STATES

Amnon Ginati
European Space Agency (ESA) — THE NETHERLANDS

Rapporteur

Klaus Briess
Technische Universität Berlin — GERMANY

B4.5 Access to Space for Small Satellite Missions

A key challenge facing the viability and growth of the small satellite community is affordable and reliable space access. This is achieved through dedicated launches, ride-shares, piggyback launches, and spacecraft propulsion technologies to reach final operational orbit. Topics of interest for this session include the utilisation of dedicated launches, ride-share systems, auxiliary payload systems, separation and dispenser systems, and small spacecraft sub-system development that will enable efficient small satellite access to space and orbit change (e.g., propulsion systems). Includes lessons learned from users on technical and programmatic approaches. For a discussion of small launchers concepts and operations, please refer to session D2.7.

Co-Chair

Alex da Silva Curiel
Surrey Satellite Technology Ltd — UNITED KINGDOM

Jeffery Emdee
The Aerospace Corporation — UNITED STATES

B4.6A Generic Technologies for Small/Micro Platforms

This session covers emerging and promising generic technologies for small and micro platforms. Real-life examples are particularly encouraged, both recently launched and shortly to be launched (next 3 years).

Co-Chair

Nicholas Waltham
Rutherford Appleton Laboratory — UNITED KINGDOM

Philip Davies
Surrey Satellite Technology Ltd — UNITED KINGDOM

B4.6B Generic Technologies for Nano/Pico Platforms

This session covers emerging and promising generic technologies for nano and pico platforms. Real-life examples are particularly encouraged, both recently launched and shortly to be launched (next 3 years).

Co-Chair

Nicholas Waltham
Rutherford Appleton Laboratory — UNITED KINGDOM

Andrew Davies
Astrium UK — UNITED KINGDOM

Rapporteur

Joost Elstak
Surrey Satellite Technology Ltd — UNITED KINGDOM

B4.7A Space Systems and Architectures Featuring Cross-Platform Compatibility

Ideas are solicited for modular, reconfigurable, adaptable systems (spacecraft, ground systems and networks) that feature cross-platform compatibility as a way to achieve mission lifecycle effectiveness. Applications are sought in science, exploration, commerce, and other areas requiring rapid but stable system design and deployment. System-enabling plug-and-play interface definitions and recommendations for standardisation (mechanical, electrical, software and fluids) are particularly desirable.

Co-Chair

Jaime Esper
National Aeronautics and Space Administration (NASA) — UNITED STATES

Marco D'Errico
Seconda Universita' di Napoli — ITALY

Rapporteur

Peter Mendham
SciSys Ltd — UNITED KINGDOM

B4.7B Small Distributed Space Missions

The session will be a forum for space missions relying on synergic use of small space vehicles, thus including constellations and formations, in either the cases of allocation of different functions on different vehicles or of distribution of all functions all across the system. Various aspects of distributed space missions will be addressed, including: new arising applications; design, integration, and operation of distributed sensors; relative GNC; advanced concept of spacecraft design (modularity, autonomy, standardisation, plug & play components) to achieve adequate performance at an acceptable cost; novel specific technologies. It is recommended that, in addition to discussing relevant theoretical aspects, potential contributors focus on practical challenges and potential solutions. Therefore, examples of missions or projects implementing in full or in part the distributed mission concept are particularly welcome.

Co-Chair

Marco D'Errico
Seconda Universita' di Napoli — ITALY

Jaime Esper
National Aeronautics and Space Administration (NASA) — UNITED STATES

Rapporteur

Giancarmine Fasano
University of Naples «Federico II» — ITALY

B4.8 Hitchhiking to the Moon

Based on the significant number of robotic lunar missions of the last decade, a dramatically increased interest in exploration of the Moon for the purpose of developing a permanent human and robotic presence, both for science and space exploration objectives can be expected for the next decades. This renewed interest is broad and international, involving space agencies from the USA, Europe, China, India, Japan, Russia, Germany, UK, and others. Efforts like NASA Lunar Science Institute's (NLSI) rapidly growing global network of affiliates - academic and research institutions who each act as nodes within an existing network of own partners - create demands for additional payload and flight opportunities, particularly from countries who just started their involvement in lunar exploration and science. In the future, it is expected that there will be more opportunities for ride-sharing or secondary or tertiary payload opportunities to be flown to the Moon, even as part of commercial enterprises like Google Lunar X-PRIZE missions. Examples from recent years are ESA's SMART-1 mission launched as a copassenger opportunity from GTO, ISRO's Chandrayaan spacecraft offering its platform as an opportunity to fly international instruments to the Moon or NASA's Lunar Reconnaissance Orbiter (LRO) spacecraft providing an opportunity for a secondary payload to the Moon, in the form of the LCROSS lunar impactor mission. This session provides a forum for the exchange of ideas for such small payloads to be demonstrated at the Moon, by hitchhiking a ride to the Moon. Examples of such payloads or missions include but are not limited to: micro-spacecraft orbiters, CubeSats, small probes, penetrators, microlanders, hard landers, micro-rovers, secondary payload surface science instruments, distributed network landers, and many more. The focus of this session is on new mission concepts, technology readiness and ride-sharing requirements.

Co-Chair

Leon Alkalai
National Aeronautics and Space Administration (NASA)/Jet Propulsion Laboratory — UNITED STATES

Rene Laufer
Baylor University — UNITED STATES

Rapporteur

Adam Baker
Rocket Engineering Ltd. — UNITED KINGDOM

B5 SYMPOSIUM ON INTEGRATED APPLICATIONS

Space systems are more and more involved in the delivery of global utilitarian services to end users. The concept of Integrated Applications encompasses the simultaneous use of basic space services and technologies. This symposium will address various aspects of integrated applications. Integrated applications combine different space systems (Earth observation, navigation, telecommunications, etc) with airborne and ground-based systems to deliver solutions to local, national and global needs. They exploit the synergies between different data sources to provide the right information at the right time to the right user in a cost-effective manner and deliver the data to users in a readily usable form. The goal of the symposium is to enable the development of end-to-end solutions by connecting the communities that are driving toward end-to-end solutions with those that are developing enabling technologies for integrated applications. For the purposes related to the small satellites, please refer also to the session B4.4.

Coordinator

Amnon Ginati
European Space Agency (ESA) — THE NETHERLANDS

Larry Paxton
The John Hopkins University Applied Physics Laboratory — UNITED STATES

B5.1 Integrated Applications End-to-End Solutions

The session will be a forum for end-to-end solutions, including case studies, proof-of concept missions, and current projects that provide, or could provide, innovative user-driven solutions. Applications that combine ground- and space-based data sources with models to address specific user requirements will be presented. These examples can cover a variety of domains, like disaster/crises monitoring and management, energy, food security, space situational awareness, transportation, health, etc. The user needs, the structure of the user communities, the value chain, the business case, the sustainability of the solutions are among the many aspects that can be considered. Examples of projects with established partnerships and fluent working relationships between space and non-space stakeholders shall be presented.

Co-Chair

David Y. Kusnierkiewicz
The John Hopkins University — UNITED STATES

Amnon Ginati
European Space Agency (ESA) — THE NETHERLANDS

Rapporteur

Boris Penné
OHB-System AG — GERMANY

B5.2 Tools and Technology in Support of Integrated Applications

The session will focus on specific systems, tools and technology in support of integrated applications and address the various issues associated with the design of space and ground systems, the kind of data they collect, how they collect data, and how the data are integrated and distributed to address key user needs. Possible topics include: groundtruthing of space data; innovative, low-cost tools for space data distribution and access; new ways of distributing integrated data products; data fusion and visualization tools especially those using COTS systems; managing integrated applications programmes; education and outreach for integrated programmes, etc.

Co-Chair

Larry Paxton
The John Hopkins University Applied Physics Laboratory — UNITED STATES

Carsten Tobehn
European Space Agency (ESA) — THE NETHERLANDS

Rapporteur

David Y. Kusnierkiewicz
The John Hopkins University — UNITED STATES

B6 SPACE OPERATIONS SYMPOSIUM

The Space Operations symposium addresses operations concepts and cost reductions, and training. The topics address all aspects of manned and un-manned space operations from lowearth and geosynchronous orbit, to lunar and planetary missions as well as supporting ground systems, new space initiatives, and commercial space operations. Papers related to small satellite operations may be submitted here or in session B4.3.

Coordinator

H. Neal Hammond
Space Bridges LLC — UNITED STATES

Manfred Warhaut
European Space Agency (ESA) — GERMANY

B6.1 Human Spaceflight Operations

This session focuses on the operations unique to human spaceflight. Papers may address any phase in the mission lifecycle from concept development, to ground operations, to inflight (vehicle and ground segments), to recovery and post mission analysis.

Co-Chair

Michael McKay
European Space Agency (ESA) — GERMANY

Mario Cardano
Thales Alenia Space France — ITALY

Rapporteur

Helmut Luttmann
Astrium Space Transportation — GERMANY

B6.2 New Operations Concepts and Commercial Space Operations

Operations costs often become the constraining factor for a mission - especially long duration missions. This session addresses concepts for operating new types of missions, improving mission output in quality and quantity, as well as reducing costs in commercial and governmental space enterprises.

Co-Chair

Geneviève Campan
Centre National d'Etudes Spatiales (CNES) — FRANCE

Thomas Kuch
Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR) — GERMANY

Rapporteur

Akira Tsuchida
Earth-Track Corporation — JAPAN

B6.3 Training Relevant for Operations

This session addresses the broad topic of training for operations. It includes training of ground operations, flight control, and flight personnel. It also includes training requirements and plans for newcomers in the operations domain, including commercial space operators.

Co-Chair

Paolo Ferri
European Space Agency (ESA) — GERMANY

John Auburn
VEGA Group — UNITED KINGDOM

Rapporteur

Adam Williams
European Space Agency (ESA) — FRANCE

Lionel Baize
Centre National d'Etudes Spatiales (CNES) — FRANCE

B6.4 Flight Control Operations Virtual Forum

This session is a virtual forum (not a paper session) co-sponsored by the Space Operations Committee and the Workforce Development/Young Professionals Programme Committee. The forum targets hands-on flight control/operations personnel from multiple international organisations with objectives of sharing best practices, lessons learned, and issues.

Co-Chair

Kathleen Coderre
Lockheed Martin Corporation — UNITED STATES

Katja Leuoth
Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR) — GERMANY

B6.5 B3.4 Sustainable Operation of the ISS - Joint Session of the Human Space Endeavours and Space Operations Symposia

This session will address key challenges and their solutions related to operations of the International Space Station as an integrated facility, its systems and its elements. Topics to be discussed include recent operational problems and solutions, cost reduction for affordability, new or proposed facilities or elements, and ground segment operations and planning. Also included would be topics such as logistics and logistics planning, transportation, sustainment, and the geopolitical value as a tool for promoting international cooperation.

Co-Chair

Maria Stella Lavitola
Thales Alenia Space Italia — ITALY

Bob Chesson
European Space Agency (ESA) — THE NETHERLANDS

Helmut Luttmann
Astrium Space Transportation — GERMANY

Rapporteur

Rachid Amekrane
Astrium GmbH — GERMANY

Category C

TECHNOLOGY

Common technologies to space systems, including astrodynamics,structures, power and propulsion

C1 ASTRODYNAMICS SYMPOSIUM
C2 MATERIALS AND STRUCTURES SYMPOSIUM
C3 SPACE POWER SYMPOSIUM
C4 SPACE PROPULSION SYMPOSIUM

Category coordinated by Junichiro Kawaguchi, Japan Aerospace Exploration Agency (JAXA) - JAXA

C1 ASTRODYNAMICS SYMPOSIUM

This symposium addresses advances in orbital mechanics, attitude dynamics, guidance, navigation, and control of single or multi-spacecraft systems as well as space robotics.

Coordinator

Erick Lansard
Thales Research & Technology — FRANCE

C1.1 Guidance, Navigation and Control (1)

The emphasis of this theme is on the studies and application related to the guidance, navigation and control of earth-orbiting and interplanetary spacecraft and rockets, including rendezvous and docking.

Co-Chair		Rapporteur
Alfred Ng *Canadian Space Agency — CANADA*	**Fuyuto Terui** *Japan Aerospace Exploration Agency (JAXA) — JAPAN*	**B. Lübke-Ossenbeck** *OHB-System AG — GERMANY*

C1.2 Guidance, Navigation and Control (2)

The emphasis of this theme is on the studies and application related to the guidance, navigation and control of earth-orbiting and interplanetary spacecraft and rockets, including rendezvous and docking.

Co-Chair		Rapporteur
Eberhard Gill *Delft University of Technology (TU Delft) — THE NETHERLANDS*	**James O'Donnell** *National Aeronautics and Space Administration (NASA)/Goddard Space Flight Center — UNITED STATES*	**Michael Ovchinnikov** *Keldysh Institute of Applied Mathematics, RAS — RUSSIA*

C1.3 Guidance, Navigation and Control (3)

The emphasis of this theme is on the studies and application related to the guidance, navigation and control of earth-orbiting and interplanetary spacecraft and rockets, including rendezvous and docking.

Co-Chair		Rapporteur
Arun Misra *McGill University — CANADA*	**Benedicte Escudier** *SUPAERO- Ecole Nationale Supérieure de l'Aéronautique et de l'Espace — FRANCE*	**Daniel Scheeres** *University of Colorado — UNITED STATES*

C1.4 Mission Design, Operations and Optimisation (1)

The theme covers design, operations and optimisation of Earth-orbiting and interplanetary missions, with emphasis on studies and experiences related to current and future missions.

Co-Chair		Rapporteur
Nicolas Bérend *Office National d'Etudes et de Recherches Aérospatiales (ONERA) — FRANCE*	**Michèle Lavagna** *Politecnico di Milano — ITALY*	**Kathleen Howell** *Purdue University — UNITED STATES*

C1.5 Mission Design, Operations and Optimisation (2)

The theme covers design, operations and optimistation of Earth-orbiting and interplanetary missions, with emphasis on studies and experiences related to current and future missions.

Co-Chair		Rapporteur
David B. Spencer *The Pennsylvania State University — UNITED STATES*	**Yury Razoumny** *Bauman Moscow State Technical University — RUSSIA*	**Johannes Schoenmaekers** *European Space Agency (ESA) — GERMANY*

C1.6 Orbital Dynamics (1)

This theme discusses advances in orbital dynamics, orbit determination, and orbit control. It includes orbital dynamics associated with constellations and formation flying.

Co-Chair		Rapporteur
Rock Jeng-Shing Chern *University of Science & Technology — TAIWAN, CHINA*	**Othon Winter** *Univ. Estadual Paulista - UNESP — BRAZIL*	**Josep J. Masdemont** *Universitat Politecnica de Catalunya (UPC) — SPAIN*

C1.7 Orbital Dynamics (2)

This theme discusses advances in orbital dynamics, orbit determination, and orbit control. It includes orbital dynamics associated with constellations and formation flying.

Co-Chair		Rapporteur
Jean-Paul Berthias *Centre National d'Etudes Spatiales (CNES) — FRANCE*	**Filippo Graziani** *University of Rome «La Sapienza» — ITALY*	**Weihua Zhang** *National University of Defense Technology — CHINA*

C1.8 Attitude Dynamics (1)

This theme discusses advances in spacecraft attitude dynamics and control, as well as attitude sensors and actuators. The theme also covers dynamics and control of multiple interconnected rigid and flexible bodies including tethered systems and space robots.

Co-Chair		Rapporteur
Gianmarco Radice *University of Glasgow — UNITED KINGDOM*	**Kazuya Yoshida** *Tohoku University — JAPAN*	**Willem (Herman) Steyn** *Stellenbosch University — SOUTH AFRICA*

C1.9 Attitude Dynamics (2)

This theme discusses advances in spacecraft attitude dynamics and control, as well as attitude sensors and actuators. The theme also covers dynamics and control of multiple interconnected rigid and flexible bodies including tethered systems and space robots.

Co-Chair		Rapporteur
Anna Guerman *University of Beira Interior — PORTUGAL*	**Hyochoong Bang** *Korea Advanced Institute of Science and Technology (KAIST) — KOREA, REPUBLIC OF*	**Amalia Ercoli Finzi** *Politecnico di Milano — ITALY*

C2 MATERIALS AND STRUCTURES SYMPOSIUM

This symposium provides an international forum for recent advancements in assessment of the latest technology achievements on space structures, structural dynamics, and materials. The symposium addresses the design and development of space vehicle structures and mechanical/thermal/fluidic systems. Future advances in a number of space systems applications for space power, space transportation, astrodynamics, space exploration, space propulsion, and space station will depend increasingly on the successful application of innovative materials and the development of structural concepts - particularly those relating to very large deployable (and assembled) space structures. For these applications to occur, increased interaction between these technology communities, and collaboration among technologists and mission planners needs to be pursued. Substantial improvements are essential in a wide range of current technologies, including nanotechnologies, to reduce projected costs and increase potential scientific returns from respective mission system applications. Papers in this symposium will review the projected advances in materials and space structures in this domain for advanced space systems applications.

Coordinator

Constantinos P. Stavrinidis
European Space Agency (ESA) — THE NETHERLANDS

Pavel M. Trivailo
Royal Melbourne Institute of Technology (RMIT) — AUSTRALIA

C2.1 Space Structures I - Development and Verification (Space Vehicles and Components)

The topics to be addressed include evaluation of analysis versus test results, spacecraft and launch vehicles system and subsystems e.g. pressurised structures, tanks, loads introduction, primary structures, fluidic equipment, control surfaces; examination of both onground and in-orbit testing, launch dynamic environment as related to structural design, space vehicles development and launch verification such as sine, random and acoustic vibration testing, and lessons learned.

Co-Chair		Rapporteur
Alwin Eisenmann *MT Aerospace AG — GERMANY*	**Andreas Rittweger** *Astrium Space Transportation — FRANCE*	**Jean-Alain Massoni** *Thales Alenia Space France — FRANCE*

C2.2 Space Structures II - Development and Verification (Deployable and Dimensionally Stable Structures)

The topics to be addressed include evaluation of analysis versus test results for deployable and dimensionally stable structures e.g. reflectors, telescopes, antennas; examination of both on-ground and in-orbit testing, thermal distortion and shape control, structural design, development and verification; lessons learned.

Co-Chair		Rapporteur
Paolo Gasbarri *Università di Roma «La Sapienza» — ITALY*	**Jean-Alain Massoni** *Thales Alenia Space France — FRANCE*	**Pierre Rochus** *CSL, Université de Liège — BELGIUM*

C2.3 Space Structures - Dynamics and Microdynamics

The topics to be addressed include dynamics analysis and testing, modal identification, landing and impact dynamics, pyroshock, test facilities, vibration suppression techniques, damping, micro-dynamics, in-orbit dynamic environment, wave structural propagation, excitation sources and in-orbit dynamic testing.

Co-Chair		Rapporteur
Peter M. Bainum *Howard University — UNITED STATES*	**Ijar M. Da Fonseca** *Instituto Nacional de Pesquisas Espaciais (INPE) — BRAZIL*	**Harijono Djojodihardjo** *Universitas Al Azhar Indonesia — INDONESIA*

C2.4 New Materials and Structural Concepts

The topics to be addressed include advanced materials and structural concepts of space vehicles of expendable and future reusable transportation systems. Space vehicle structural applications of high temperature and cryogenic materials, nano-materials, advanced composites, ceramics, and high temperature superconducting materials are areas of particular interest.

Co-Chair		Rapporteur
Marc Lacoste *Snecma Propulsion Solide — FRANCE*	**Iurii Moshnenko** *Yuzhnoye State Design Office — UKRAINE*	**Luigi Scatteia** *CIRA Italian Aerospace Research Centre — ITALY*

C2.5 Smart Materials and Adaptive Structures

The focus of the session will be on application of smart materials to spacecraft and launch vehicle systems, novel sensor and actuator concepts and new concepts for multi-functional and intelligent structural systems. Also included in the session will be new control methods for vibration suppression and shape control using adaptive structures as well as comparisons of predicted performance with data from ground and in-orbit testing.

Co-Chair		Rapporteur
Michael J. Eiden *— THE NETHERLANDS*	**Junjiro Onoda** *Japan Aerospace Exploration Agency (JAXA) — JAPAN*	**Paolo Gaudenzi** *University of Rome «La Sapienza» — ITALY*

C2.6 Space Environmental Effects and Spacecraft Protection

The focus of the session will be on space environmental effects and spacecraft protection. The effects of vacuum, radiation, atomic oxygen, spacecraft charging, thermal cycling, dissociation, meteoroids and space debris impact on space systems, materials and structures, and microelectronics will be addressed. Protective and shielding technologies, including analysis simulation and testing of debris impact, and susceptibility of Commercial- Off-The-Shelf (COTS) micro-electronics to space radiation will be covered.

Co-Chair		Rapporteur
Minoo Dastoor *National Aeronautics and Space Administration (NASA) — UNITED STATES*	**Akira Meguro** *Tokyo City University — JAPAN*	**Giuliano Marino** *CIRA Italian Aerospace Research Centre — ITALY*

C2.7 Space Vehicles – Mechanical/Thermal/Fluidic Systems

The topics to be addressed include novel technical concepts for mechanical/thermal/fluidic systems and subsystems of launchers, manned and unmanned spacecraft, re-entry vehicles and small satellites. Advanced subsystems and design of future exploration missions will be covered considering issues arising from material selection, cost efficiency and reliability, and advancements in space vehicle development with respect to engineering analysis, manufacturing, and test verification.

Co-Chair		Rapporteur
Oleg Alifanov *Moscow Aviation Institute — RUSSIA*	**Brij Agrawal** *Naval Postgraduate School — UNITED STATES*	**Guoliang Mao** *Beijing Institute of Aerodynamics — CHINA*

C2.8 Specialised Technologies, Including Nanotechnology

Specialised material and structures technologies are explored in a large variety of space applications both to enable advanced exploration, and science/observation mission scenarios to perform test verifications relying on utmost miniaturisation of devices and highest capabilities in structural, thermal, electrical, electromechanical/optical performances offered by the progress in nanotechnology. Examples are the exceptional performances at nano-scale in strength, electrical, thermal conduction of Carbon nanotubes which are experiencing first applications at macro-scale such as nano-composite structures, high efficiency energy storage wheels, MEMS and MOEMS devices. Molecular nanotechnology and advances in manipulation at nano-scale offer the road to molecular machines, ultracompact sensors for science applications and mass storage devices. The session encourages presentations of specialised technologies, in particular of nanomaterial related techniques and their application in devices offering unprecedented performances for space applications.

Co-Chair

Mario Marchetti
University of Rome «La Sapienza» — ITALY

Pierre Rochus
CSL, Université de Liège — BELGIUM

Rapporteur

Pavel M. Trivailo
Royal Melbourne Institute of Technology (RMIT) — AUSTRALIA

C2.9 Advancements in Materials Applications and Rapid Prototyping

The topics to be addressed include advancements in materials applications, and novel technical concepts in the rapid prototyping of mechanical systems.

Co-Chair

Thierry Romeuf
EADS Astrium — FRANCE

Franz-Josef Kahlen
University of Cape Town — SOUTH AFRICA

Rapporteur

Yeong-Moo Yi
Korea Aerospace Research Institute — KOREA, REPUBLIC OF

C3 SPACE POWER SYMPOSIUM

Reliable energy systems continue to be key for all space missions. The successful future exploration and development of space depends on the research into and deployment of new, more affordable and more reliable energy sources of diverse types ranging from the very small to the extraordinarily large. Moreover, the continuing support of government-sponsored space activities by the public will require that these activities serve human needs in obvious ways. One visionary way to achieve the latter goal is to provide non-polluting, economical energy from space to terrestrial users.
The Space Power Symposium will address all aspects of space power systems, covering the whole range of such systems from power generation, energy conversion and storage, power management, power transmission and distribution at system and sub-system levels including commercial considerations, with an emphasis on new, advanced concepts. It will thus also include but not be restricted to topics such as advanced solar and nuclear systems for spacecraft power and propulsion, novel power generation and energy harvesting, and examine the prospects for using space-based power plants to provide energy remotely to the Earth or other planets.

Coordinator

Leopold Summerer
European Space Agency (ESA) — THE NETHERLANDS

C3.1 Space-Based Solar Power Architectures – New Governmental and Commercial Concepts and Ventures

This session deals with all aspects of architectures and concepts for space-based solar power plants. It will be structured in two half-sessions, one focusing on governmental activities and one concentrating on the increasingly active commercial ventures in this domain. By doing so, it provides a unique common platform to discuss these two very different approaches and contribute to a cross-fertilisation between the two communities. Topically it will include all system-level, architectural, organisational and commercial aspects of solar power from space, including modelling and optimisation as well as nontechnical aspects of space solar power. While primarily focused on concepts delivering solar power for terrestrial needs, space-to-space architectures will also be covered.

Co-Chair

Leopold Summerer
European Space Agency (ESA) — THE NETHERLANDS

John C. Mankins
ARTEMIS Innovation Management Solutions, LLC — UNITED STATES

Rapporteur

Nobuyuki Kaya
Kobe University — JAPAN

C3.2 Wireless Power Transmission Technologies, Experiments and Demonstrations

This session focuses on all aspects of wireless power transmission systems. It covers all type of wireless power transmission technologies, including laser, microwave-based as well as novel wireless power transmission technologies from the short ranges e.g. within spacecraft or between two surface installations up the very large distances for space exploration and power transmission from space to ground. The session includes theoretical as well as applied and experimental results, including emitter/receiver antenna architectures and deployment.

Co-Chair

Nobuyuki Kaya
Kobe University — JAPAN

Andrea Massa
Trento University — ITALY

Rapporteur

Frank Steinsiek
Astrium Space Transportation — GERMANY

Massimiliano Vasile
University of Strathclyde — UNITED KINGDOM

C3.3 Advanced Space Power Technologies and Concepts

This session covers all type of advanced space power technologies and concepts. These include technologies and concepts related to power generation (solar, nuclear, other) and harvesting, power conditioning, management and distribution, energy storage, and energy generation. This session focuses on the power systems in the hundreds of watts and above, including large power systems for telecom spacecraft and novel power architectures for planetary, asteroid and lunar exploration scenarios up to MW size nuclear reactor systems.

Co-Chair

Susumu Sasaki
Japan Aerospace Exploration Agency (JAXA)/ ISAS — JAPAN

Carla Signorini
European Space Agency (ESA) — THE NETHERLANDS

Rapporteur

George Schmidt
National Aeronautics and Space Administration (NASA)/Glenn Research Center — UNITED STATES

Leopold Summerer
European Space Agency (ESA) — THE NETHERLANDS

C3.4 Small and Very Small Advanced Space Power Systems

This session is devoted to emerging concepts of very small power systems typically below the tens of Watts but including micro and milli-Watt power harvesting technologies. While the space power market is still dominated by increasing power systems for large platforms, essentially telecom platforms, a dynamic market is emerging on the low power and low performance fringes of space in the form of nano-, micro and mini spacecraft. This session is dedicated to power systems for such applications as well as for very low power longduration exploration probes and sensors.

Co-Chair

Massimiliano Vasile
University of Strathclyde — UNITED KINGDOM

Shoichiro Mihara
Institute for Unmanned Space Experiment Free Flyer (USEF) — JAPAN

Rapporteur

Alex Ignatiev
University of Houston — UNITED STATES

Susumu Sasaki
Japan Aerospace Exploration Agency (JAXA)/ISAS — JAPAN

C3.5 C4.7 Joint Session on Nuclear Propulsion and Power

This session, organised jointly between the space power and the Space Propulsion Symposium includes papers addressing all aspects related to nuclear power and propulsion for space applications.

Co-Chair

Leopold Summerer
European Space Agency (ESA) — THE NETHERLANDS

George Schmidt
National Aeronautics and Space Administration (NASA)/Glenn Research Center — UNITED STATES

Harvey J. Willenberg
American Aerospace Advisors, Inc. — UNITED STATES

Claudio Bruno
University of Rome «La Sapienza» — ITALY

Rapporteur

Vladimir Prisniakov
Academy of Sciences — UKRAINE

Jacques Gigou
European Space Agency (ESA) — FRANCE

C4 SPACE PROPULSION SYMPOSIUM

The Space Propulsion Symposium addresses sub-orbital, earth to orbit, and in-space propulsion. The general areas considered include both chemical and non-chemical rocket propulsion, air-breathing propulsion, and combined air-breathing and rocket systems. Typical specific propulsion categories of interest are liquid, sold and hybrid rocket systems, ramjet, scramjet, and various combinations of air-breathing and rocket propulsion and nuclear, electric, solar and other advanced rocket systems. The Symposium is concerned with component technologies, the operation and application to missions of overall propulsion systems and unique propulsion test facilities.

Coordinator

Giorgio Saccoccia
European Space Agency (ESA) — THE NETHERLANDS

Richard Blott
Space Enterprise Partnerships Limited — UNITED KINGDOM

C4.1 Propulsion System (1)

This session is dedicated to all aspects of Liquid Rocket Engines.

Co-Chair

Max Calabro
The Inner Arch — FRANCE

Christophe Bonhomme
Centre National d'Etudes Spatiales (CNES) — FRANCE

Rapporteur

Walter Zinner
Astrium GmbH — GERMANY

C4.2 Propulsion System (2)

This session is dedicated to all aspects of Solid and Hybrid Propulsion.

Co-Chair

Jean-François Guery
Safran SME — FRANCE

I-Shih Chang
The Aerospace Corporation — UNITED STATES

Rapporteur

Toru Shimada
Japan Aerospace Exploration Agency (JAXA) — JAPAN

C4.3 Propulsion Technology

This session includes all science and technologies supporting all aspects of space propulsion. The emphasis in this session is posed in particular on components for propulsion.

Co-Chair

John Harlow—
UNITED KINGDOM

James Free
National Aeronautics and Space Administration (NASA) — UNITED STATES

Rapporteur

Didier Boury
Snecma Propulsion Solide — FRANCE

C4.4 Electric Propulsion

This session is dedicated to all aspects of electric propulsion technologies, systems and applications.

Co-Chair

Garri A. Popov
RIAME — RUSSIA

Mariano Andrenucci
Alta S.p.A. — ITALY

Rapporteur

Rafael Spears
L-3 Communications — UNITED STATES

C4.5 Hypersonic and Combined Cycle Propulsion

This session includes papers dealing with use of air in earth-to-orbit propulsion.

Co-Chair

Shigeru Aso
Kyushu University — JAPAN

Patrick DANOUS
Snecma — FRANCE

Rapporteur

Salvatore Borrelli
CIRA Italian Aerospace Research Centre — ITALY

C4.6 Missions Enabled by New Propulsion Technology and Systems

Many missions are precluded by limitations on current propulsion technologies and systems. The session will explore concepts for new missions that can be enabled by specific advancements in propulsion and/or integration of various propulsion technologies and systems.

Co-Chair

Giorgio Saccoccia
European Space Agency (ESA) — THE NETHERLANDS

David Micheletti —
UNITED STATES

Rapporteur

Jerrol Littles
Pratt & Whitney Rocketdyne — UNITED STATES

C4.7 C3.5 Joint Session on Nuclear Propulsion and Power

This session, organised jointly between the space power and the space propulsion symposium includes papers addressing all aspects related to nuclear power and propulsion for space applications.

Co-Chair

Claudio Bruno
University of Rome «La Sapienza» — ITALY

Harvey J. Willenberg
American Aerospace Advisors, Inc. — UNITED STATES

Leopold Summerer
European Space Agency (ESA) — THE NETHERLANDS

George Schmidt
National Aeronautics and Space Administration (NASA)/Glenn Research Center — UNITED STATES

Rapporteur

Jacques Gigou
European Space Agency (ESA) — FRANCE

Vladimir Prisniakov
Academy of Sciences — UKRAINE

C4.8 Special Session on Combined Chemical and Electrical Propulsion Applications and Technologies

The special session is to investigate how best to combine chemical and electrical propulsion technologies to achieve the best performance and cost trade-off in space applications. The purpose is to encourage co-operation between mission designers, spacecraft manufacturers and chemical & electrical propulsion suppliers in new innovative mission design at lower costs. Particular consideration should be given to improving launch vehicle economics for both commercial and exploration missions.

Co-Chair

William W. Smith
Aerojet-General Corporation — UNITED STATES

Richard Blott
Space Enterprise Partnerships Limited — UNITED KINGDOM

Rapporteur

Davina Di Cara
European Space Agency (ESA) — THE NETHERLANDS

Category D

INFRASTRUCTURE

Systems sustaining space missions, including space system transportation, future systems and safety

D1 SPACE SYSTEMS SYMPOSIUM
D2 SPACE TRANSPORTATION SYMPOSIUM
D3 SYMPOSIUM ON STEPPING STONES TO THE FUTURE: STRATEGIES, ARCHITECTURES, CONCEPTS AND TECHNOLOGIES
D4 SYMPOSIUM ON VISIONS AND STRATEGIES FOR FAR FUTURES
D5 44TH SYMPOSIUM ON SAFETY AND QUALITY IN SPACE ACTIVITIES
D6 SYMPOSIUM ON COMMERCIAL SPACEFLIGHT SAFETY ISSUES

Category coordinated by John-David F. Bartoe, National Aeronautics and Space Administration (NASA) - UNITED STATES

D1 SPACE SYSTEMS SYMPOSIUM

Innovative Space Systems for Future and Current Missions and Applications.

Coordinator

Robert L. Henderson
The John Hopkins University Applied Physics Laboratory — UNITED STATES

Reinhold Bertrand
European Space Agency (ESA) — GERMANY

D1.1 Innovative and Visionary Space Systems Concepts

Dreams of yesterday are a reality today. Dreams of tomorrow need to be looked at today to make them real in the future. With emerging new technologies, it is now possible to conceptualise new and innovative space systems and new potential applications for the future. This session will explore innovative technologies, services, software and concepts for space systems for the future.

Co-Chair

Mauricio Moshe Guelman
Asher Space Research Institute, Technion, I.I.T. — ISRAEL

Robert L. Henderson
The John Hopkins University Applied Physics Laboratory — UNITED STATES

Rapporteur

Peter Dieleman
National Aerospace Laboratory (NLR) — THE NETHERLANDS

D1.2 Enabling Technologies for Space Systems

This session will focus on innovative, technological developments that are usually high risk, but which have the potential to significantly enhance the performance of existing and new space systems. Enabling innovative technologies for space applications often result from spin-ins which will be discussed during the session, together with potential spin-offs. Examples include instrumentation, biotechnology, components, micro- and nanotechnology, MEMS, advanced new structures and software techniques.

Co-Chair

Xavier Roser
Thales Alenia Space France — FRANCE

Jean-Paul Aguttes
Centre National d'Etudes Spatiales (CNES) — FRANCE

Rapporteur

Eiichi Tomita
Japan Aerospace Exploration Agency (JAXA) — JAPAN

D1.3 System Engineering Tools, Processes and Training (1)

This session will focus on state-of-the-art system engineering methodologies, design techniques, tools, processes, and training that reduce the time and cost, and improve the quality of space system design. Of special interest are multi-disciplinary methods, tools, and processes including modelling and simulation used to define system architectures to improve risk management, safety, reliability, testability, quality of life cycle cost estimates, and to improve the training of system engineers.

Co-Chair

Geilson Loureiro
Instituto Nacional de Pesquisas Espaciais (INPE) — BRAZIL

Xavier Roser
Thales Alenia Space France — FRANCE

Rapporteur

Ming Li
China Academy of Space Technology (CAST) — CHINA

D1.4 Space Systems Architectures

The subject of this session is current and future space system architectures to increase performance, efficiency, reliability, and flexibility of application. Topics of interest include the design of flight and ground system (hardware & software) architectures and the partitioning of functions between them, small satellite constellations and formations (swarms), and the use of on-board autonomy and autonomous ground operations.

Co-Chair

Peter Dieleman
National Aerospace Laboratory (NLR) — THE NETHERLANDS

Reinhold Bertrand
European Space Agency (ESA) — GERMANY

Rapporteur

Franck Durand-Carrier
Centre National d'Etudes Spatiales (CNES) — FRANCE

D1.5 Lessons Learned in Space Systems

Experiences, both positive and negative, that have been encountered in space systems (hardware & software) design, development and operation. End-to-end lessons learned and impacts on cost, schedule and performance, in the areas of (among others): international cooperation, the use of COTS products, partitioning of functions between flight and ground systems, the extent and fidelity of simulations, integration, test and operations.

Co-Chair

Anne Bondiou-Clergerie
GIFAS — FRANCE

Klaus Schilling
University of Würzburg — GERMANY

Rapporteur

Takashi Hamazaki
Japan Aerospace Exploration Agency (JAXA) — JAPAN

D1.6 System Engineering Tools, Processes and Training (2)

This session will focus on state-of-the-art system engineering methodologies, design techniques, tools, processes, and training that reduce the time and cost, and improve the quality of space system design. Of special interest are multi-disciplinary methods, tools, and processes including modelling and simulation used to define system architectures to improve risk management, safety, reliability, testability, quality of life cycle cost estimates, and to improve the training of system engineers.

Co-Chair

Takashi Hamazaki
Japan Aerospace Exploration Agency (JAXA) — JAPAN

Franck Durand-Carrier
Centre National d'Etudes Spatiales (CNES) — FRANCE

Rapporteur

Reinhold Bertrand
European Space Agency (ESA) — GERMANY

D2 SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM

Topics should address worldwide space transportation solutions and innovations. The goal is to foster understanding and cooperation amongst the world's space-faring organisations.

Coordinator

Richard Tyson
National Aeronautics and Space Administration (NASA)/Marshall Space Flight Center — UNITED STATES

Christophe Bonnal
Centre National d'Etudes Spatiales (CNES) — FRANCE

Secretary

John M. Horack
University of Alabama in Huntsville — UNITED STATES

D2.1 Launch Vehicles in Service or in Development

Review of up to date status of launch vehicle currently in use in the world or under short term development.

Co-Chair

Christian Dujarric
European Space Agency (ESA) — FRANCE

Ray F. Johnson
The Aerospace Corporation — UNITED STATES

Rapporteur

Paulo Moraes Jr.
Instituto de Aeronáutica e Espaço (IAE) — BRAZIL

D2.2 Launch Services, Missions, Operations and Facilities

Review of the current and planned launch services and support, including economics of space transportation systems, financing, insurance, licensing. Advancements in ground infrastructure, ground operations, mission planning and mission control for both expendable and reusable launch services.

Co-Chair

Patrick M. McKenzie
Ball Aerospace & Technologies Corp. — UNITED STATES

Yves Gérard
Astrium Space Transportation — FRANCE

Rapporteur

Ulf Palmnäs
Volvo Aero Corporation — SWEDEN

D2.3 Upper Stages, Space Transfer, Entry and Landing Systems

Discussion of existing, planned or new advanced concepts for cargo and human orbital transfer. Includes current and near term transfer, entry and landing systems, sub-systems and technologies for accommodating crew and cargo transfer in space.

Co-Chair

Luigi Bussolino
Bussolino and Associates — ITALY

Harry A. Cikanek
National Aeronautics and Space Administration (NASA) — UNITED STATES

Rapporteur

Kenneth Bruce Morris
National Aeronautics and Space Administration (NASA)/Marshall Space Flight Center — UNITED STATES

D2.4 Future Space Transportation Systems

Discussion of future system designs and operational concepts for both expendable and reusable systems for Earth-to orbit transportation and exploration missions.

Co-Chair

Sundaram Ramakrishnan
Vikram Sarabhai Space Centre (VSSC) — INDIA

David Glass
National Aeronautics and Space Administration (NASA) — UNITED STATES

Rapporteur

José Gavira Izquierdo
European Space Agency (ESA) — THE NETHERLANDS

D2.5 Future Space Transportation Systems Technologies

Discussion of technologies enabling new reusable or expendable launch vehicles and inspace transportation systems. Emphasis is on hardware development and verification before flight.

Co-Chair

Yoshifumi Inatani
Japanese Rocket Society — JAPAN

Sylvain Guédron
Centre National d'Etudes Spatiales (CNES) — FRANCE

Rapporteur

William R. Claybaugh II
Orbital Sciences Corporation — UNITED STATES

D2.6 Future Space Transportation Systems Verification and In-Flight Experimentation

Discussion of system, subsystems and technologies flight testing for future space transportation systems. Emphasis is on flight experimentation/verification including technology demonstrators and test experience.

Co-Chair

Giorgio Tumino
European Space Agency (ESA) — FRANCE

Charles Cockrell
National Aeronautics and Space Administration (NASA) — UNITED STATES

Rapporteur

Leo Daniel
Massachussets Institute of Technology (MIT) — UNITED STATES

D2.7 Small Launchers: Concepts and Operations

Discussion of existing, planned and future Launchers for small payloads ranging from 1500 kg to as low as 1 kg into Low Earth Orbit. Includes innovative solutions such as airborne systems, evolutions from sub-orbital concepts and flexible, highly responsive concepts. Includes mission operations, associated operations and specific constraints.

Co-Chair

Markus Jäger
Astrium Space Transportation — GERMANY

Shayne Swint
National Aeronautics and Space Administration (NASA)/Marshall Space Flight Center — UNITED STATES

Rapporteur

Nicolas Bérend
Office National d'Etudes et de Recherches Aérospatiales (ONERA) — FRANCE

D2.8 Heavy Lift Launchers Capabilities and New Missions

The session will address heavy lift capabilities, existing or under study, for new science, human exploration and other missions. The session will also deal with worldwide needs, requirements and potential missions enabled by heavy lift launchers.

Co-Chair

Martin Sippel
Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR) — GERMANY

Steve Creech
National Aeronautics and Space Administration (NASA) — UNITED STATES

Rapporteur

Gennaro Russo
CIRA Italian Aerospace Research Centre — ITALY

D2.9
D6.2

Joint Session on Private Human Access to Space: Sub-Orbital and Orbital Missions

This session is co-sponsored by IAA Commission III and will address topics such as systems, technical solutions, legal aspects, market analysis, insurance, regulatory constraints, spaceports.

Co-Chair

Jens Lassmann
EADS Space — GERMANY

Douglas O. Stanley
Georgia Institute of Technology — UNITED STATES

D3

SYMPOSIUM ON BUILDING BLOCKS FOR FUTURE SPACE EXPLORATION AND DEVELOPMENT

This Symposium, organized by the International Academy of Astronautics will involve papers and discussion that traverse a wide range of highly valuable future space capabilities (FSC) - in other words "building blocks" for future space exploration, development and discovery - that could enable dramatic advances in global space goals and objectives. The international discussion of future directions for space exploration and utilisation is fully underway, including activities involving all major space-faring nations. Decisions are now being made that will set the course for space activities for many years to come. New approaches are needed that establish strategies, architectures, concepts and technologies that will lead to sustainable human and robotic space exploration and utilization during the coming decades.
This symposium will examine the possible paths, beginning with current capabilities such as the International Space Station, which may lead to ambitious future opportunities for space exploration, discovery and benefits. The sessions that comprise this symposium are key elements of current or planned International Academy of Astronautics (IAA) studies.

Coordinator

John C. Mankins
ARTEMIS Innovation Management Solutions, LLC — UNITED STATES

Alain Pradier
European Space Agency (ESA) — THE NETHERLANDS

D3.1

Strategies & Architectures as the Framework for Future Building Blocks in Space Exploration and Development

Future scenarios for sustainable exploration and development in space will unfold in the context of global conditions that vary greatly from those of the 1950s-1970s (the first generation of space programmes, driven by international competition), or those of the 1980s- 2000s (the second generation of space programmes, enabled by international cooperation). Looking to the future, it is likely that space-faring countries will pursue their goals and objectives in a more building-block fashion focused on developing high-value future space capabilities, rather than through massive, geo-politically driven programmes. Increasingly, these developments may also reflect future commercial space opportunities. As a result, it is important that the international community should engage in an ongoing discussion of strategies and architectures to frame a "building block" approach to our future in space. Such a discussion should involve sustainable budgets and multiple-purpose system-of systems capabilities that lead to a diverse range of future activities of broad benefit to humanity. This session, which is related to a prospective new International Academy of Astronautics (IAA) study group, will address strategies and architectural approaches that may allow a new paradigm, a "building block" approach, to be established among the spacefaring countries. Papers are solicited in these and related areas.

Co-Chair

John C. Mankins
ARTEMIS Innovation Management Solutions, LLC — UNITED STATES

Maria Antonietta Perino
Thales Alenia Space Italia — ITALY

Rapporteur

William H. Siegfried
The Boeing Company — UNITED STATES

Horst Rauck
GERMANY

D3.2

Systems and Infrastructures to Implement Future Building Blocks in Space Exploration and Development

The emergence of novel systems and infrastructures will be needed to enable ambitious scenarios for sustainable future space exploration and utilization. New, reusable space infrastructures must emerge in various areas include the following: (1) infrastructures that enable affordable and reliable access to space for both exploration systems and logistics; (2) infrastructures for affordable and reliable transportation in space, including access to/from lunar and planetary surfaces for crews, robotic and supporting systems and logistics; (3) infrastructures that allow sustained, affordable and highly effective operations on the Moon, Mars and other destinations; and, (4) supporting in space infrastructures that provide key services (such as communications, navigation, etc.). Papers are solicited in these and related areas.

Co-Chair

William H. Siegfried
The Boeing Company — UNITED STATES

Scott Hovland
European Space Agency (ESA) — THE NETHERLANDS

Rapporteur

Horst Rauck
GERMANY

Paivi Jukola
Helsinki University of Technology — FINLAND

D3.3

Novel Concepts and Technologies for Enable Future Building Blocks in Space Exploration and Development

In order to realise future, sustainable programmes of space exploration, utilisation and commercial development, a focused suite of transformational new concepts and supporting technologies must be advanced during the coming years. The technical objectives to be pursued should be drawn from a broad, forward looking view of the technologies and systems needed, but must be sufficiently well focused to allow tangible progression—and dramatic improvements over current capabilities—to be realized in the foreseeable future. This session will address cross cutting considerations in which a number of discipline research topics and/or technologies may be successful synthesized to enable a transformation new systems concept to be achieved. Papers are solicited in these and related areas.

Co-Chair

Alain Pradier
European Space Agency (ESA) — THE NETHERLANDS

Alain Dupas
European Bank for Reconstruction and Development — FRANCE

Rapporteur

Christopher Moore
National Aeronautics and Space Administration (NASA) — UNITED STATES

Junjiro Onoda
Japan Aerospace Exploration Agency (JAXA) — JAPAN

D3.4

Space Technology and System Management Practices and Tools

The effective management of space technology and systems development is critical to future success in space exploration, development and discovery. This session is the next in an ongoing series at the International Astronautical Congress that provides a unique international forum to further the development of a family of "best practices and tools" in this important field. Specific areas of potential interest include: (1) Technology Management Methodologies and Best Practices; (2) R&D Management Software Tools and Databases; and, (3) Systems Analysis Methods and Tools. The full range of R&D activities are appropriate for discussion, ranging from technology development long-term planning, through technology R&D programmes, to system development projects, with special emphasis on the transition of new technologies from one stage to the next. Particular topics could include: Technology Readiness Levels (TRLs) and Technology Readiness Assessments, Technology R&D Risk Assessments and Management, Advanced Concepts Modeling Approaches and Tools, etc. Either more theoretical discussions, or examples of applications of R&D management techniques and/or tools to specific R&D programmes and projects are of interest for the session.

Co-Chair

John C. Mankins
ARTEMIS Innovation Management Solutions, LLC — UNITED STATES

Paivi Jukola
Helsinki University of Technology — FINLAND

Rapporteur

Maria Antonietta Perino
Thales Alenia Space Italia — ITALY

Hans E.W. Hoffmann
ORBComm Inc — GERMANY

D4

SYMPOSIUM ON VISIONS AND STRATEGIES FOR THE FAR FUTURE

This 10th Symposium is organized by the International Academy of Astronautics (IAA). In space activities the focus is usually kept on short term developments, at the expense of far future goals. The Symposium will discuss goals with at least 20 to 30 years of prospective and identify technologies and methodologies that need to be developed. These developments will also be examined with the intention to support short/medium-term projects and to identify the priorities required for their development. The symposium will address innovative public/ private initiatives mainly in the technology field, with the goal to decrease the development and operation costs. How space activities can contribute to the resolution of world societal challenges will also be addressed.

Coordinator

Giuseppe Reibaldi
European Space Agency (ESA) — THE NETHERLANDS

Hans E.W. Hoffmann
ORBComm Inc — GERMANY

D4.1

Novel Concepts and Technologies

In order to realise future, sustainable programmes of space exploration and utilisation, a focused suite of transformational new systems concepts and supporting technologies must be advanced during the coming decade. The technical objectives to be pursued should be drawn from a broad, forward looking view of the technologies and systems needed, but must be sufficiently well focused to allow tangible progression and dramatic improvements over current capabilities to be realized in the foreseeable future. This session will address cross cutting considerations in which a number of discipline research topics and/or technologies may be successful synthesized to enable a transformation new systems concept to be achieved. Papers are solicited in these and related areas.

Co-Chair

Claudio Bruno
University of Rome «La Sapienza» — ITALY

Alain Dupas
European Bank for Reconstruction and Development — FRANCE

Rapporteur

Paivi Jukola
Helsinki University of Technology — FINLAND

Hans E.W. Hoffmann
ORBComm Inc — GERMANY

D4.2
E6.3

Joint Session on Global Public/Private Innovative Initiatives in Spaceflight

This session will cover innovative system concepts in spaceflight activities, including human spaceflight, to reduce the costs of space launch and in-orbit infrastructures while increasing utilization. The complementary roles of industry and governments at a global scale shall be discussed, initiatives and emerging issues will be presented.

Co-Chair

Horst Rauck
GERMANY

Rachel Villain
Euroconsult — FRANCE

Rapporteur

Sundaram Ramakrishnan
Vikram Sarabhai Space Centre (VSSC) — INDIA

D4.3

Space Elevator Feasibility and Technology

A visionary, far future concept that has received particular attention during the past two decades is of the "Space Elevator" – a space access option that might, if successfully developed, enable extremely large-scale access to space at a low marginal cost. However, there remain numerous conceptual and technologically challenges that must be overcome before the Space Elevator can be deemed technically feasible, or economically viable. In support of an ongoing IAA study group, this session will encompass the identification of key technologies for the Space Elevator concept, examine the TRLs (technology readiness level) of these, and consider the likely challenge and uncertainties in research and development (R&D) efforts focused on the Space Elevator. The session also invites reports on relevant recent R&D results, and will identify possible development strategies for space elevators and tethers.

Co-Chair

Peter A. Swan
Teaching Science and Technology, Inc. — UNITED STATES

Robert E Penny
Cholla Space Systems — UNITED STATES

Rapporteur

David Raitt
THE NETHERLANDS

D4.4

Contribution of Space Activities to Solving Global Societal Challenges

The session will discuss the contributions in the far future of space activities to the solution of world challenges (e.g. energy, population...), and how the space systems approach will support the understanding of the global societal issues. The session shall also include the identification of the related technologies that need to be developed. World global challenges will be discussed and the possible contributions of space activities identified. The definition of a roadmap will be encouraged. Environmental issues including global climate change will be not covered in this particular session.

Co-Chair

John C. Mankins
ARTEMIS Innovation Management Solutions, LLC — UNITED STATES

Giuseppe Reibaldi
European Space Agency (ESA) — THE NETHERLANDS

Rapporteur

Paivi Jukola
Helsinki University of Technology — FINLAND

D5

45th SYMPOSIUM ON SAFETY AND QUALITY IN SPACE ACTIVITIES

This 45th Symposium organised by the International Academy of Astronautics addresses management approaches, design solutions, and regulations to improve the quality, efficiency, and collaborative ability of space programmes. All aspects are considered: international cooperation, knowledge management, risk management, complexity of systems and operations, human factors, economical constraints, norms, and standards.

Coordinator

Jeanne Holm
National Aeronautics and Space Administration (NASA)/Jet Propulsion Laboratory — UNITED STATES

D5.1 Ensuring Quality and Safety in a Cost Constrained Environment: Which Trade-Offs to Make?

Throughout the design, development, and operation of every kind of space mission, the ambition is usually to create striking performances (but also usually with constrained budget). This session deals with the methods used and lessons learned dealing with such a challenge.

Co-Chair

Manola Romero
Office National d'Etudes et de Recherches Aérospatiales (ONERA) — FRANCE

Alexander S. Filatyev
Central Aero-HydroDynamic Institute — RUSSIA

Rapporteur

Garett Smith
Airbus SAS — FRANCE

D5.2 Knowledge Management and Collaboration in Space Activities

Working on complex space missions requires virtual teaming, learning lessons from the past, transferring knowledge from experts to younger generations, and developing deep expertise within an organisation.

- How are aerospace organisations managing the ability to share knowledge to develop new missions?
- What solutions are in place to work securely across corporate and international boundaries?
- How is knowledge captured, shared, and used to drive innovation?

This session focuses on the methods and technologies that organisations are using to sustain, energise and invigorate their ability to learn, innovate, and share knowledge within and amongst organisations for sustainable, peaceful exploration of space. Case studies and defined approaches will discuss:
- Analysis of successful projects and innovations in the application of knowledge management
- Grounded research in knowledge and risk management
- Capture of technical expertise and lessons learned from previous successful projects that are applicable to new programmes and focus on driving innovation.

Methods that allow data, information or knowledge exchange within or amongst organisations in support of actual programmes or missions are of particular interest.

Co-Chair

Jeanne Holm
National Aeronautics and Space Administration (NASA)/Jet Propulsion Laboratory — UNITED STATES

Roberta Mugellesi-Dow
European Space Agency (ESA) — GERMANY

Rapporteur

Lionel Baize
Centre National d'Etudes Spatiales (CNES) — FRANCE

D5.3 Space Weather and Effects: Prediction, Analysis and Protection

Space missions are affected by the fluctuating solar activity and local space environment. New exploration programmes, especially manned programmes, stress the need for real «space weather forecasts».
This session will deal with:
- Space environment and effects: modelling and ground testing
- Lessons learned from space mission failures due to the space environment
- Space solar activity and space weather measurements
- Space weather prediction
- Standardisation and data policy for space weather

Co-Chair

Jean-Francois Roussel
Office National d'Etudes et de Recherches Aérospatiales (ONERA) — FRANCE

Mengu Cho
Kyushu Institute of Technology — JAPAN

D6 SYMPOSIUM ON COMMERCIAL SPACEFLIGHT SAFETY ISSUES

Topics should address commercial safety and regulatory policy issues for orbital and suborbital space transportation and spaceports. The goal is to identify issues common to commercial operators of both human and robotic space vehicles to increase international safety and interoperability.

Coordinator

John Sloan
Federal Aviation Administration Office of Commercial Space Transportation (FAA/AST) — UNITED STATES

D6.1 Commercial Space Flight Safety and Emerging Issues

Discussion of emerging issues in commercial spaceflight safety for spaceports and orbital and suborbital space transportation. Includes regulations, policy, interoperability, case studies, lessons learned and other safety issues for commercially operated space transportation.

Co-Chair

John Sloan
Federal Aviation Administration Office of Commercial Space Transportation (FAA/AST) — UNITED STATES

Mattias Abrahamsson
Spaceport Sweden — SWEDEN

Rapporteur

Julia Tizard
Virgin Galactic — UNITED KINGDOM

D6.2 D2.9 Joint Session on Private Human Access to Space: Sub-Orbital and Orbital Missions

This session is co-sponsored by IAA Commission III and will address topics such as systems, technical solutions, legal aspects, market analysis, onsurance, regulatory constraints, spaceports.

Co-Chair

Jens Lassmann
EADS Space — GERMANY

Douglas O. Stanley
Georgia Institute of Technology — UNITED STATES

Category E

SPACE AND SOCIETY

Interaction of space with society, including education, policy and economics, history and law

Category coordinated by Chris Welch, International Space University (ISU) - FRANCE

E1 SPACE EDUCATION AND OUTREACH SYMPOSIUM

This symposium deals with activities, methods and techniques for formal and informal space education at different educational levels, space outreach to the general public, space workforce development, etc. Each of the sessions in the symposium features an invited key note speaker followed by presentation of selected papers. Symposium sessions may also include panel discussions.
When submitting abstracts for consideration, please note that:
- Papers should have clear education or outreach content – technical details of projects, even if carried out in an educational context, will not usually qualify.
- Papers reporting on programmes/activities that have already taken place will usually be received more favourably than those dealing with concepts and plans for the future.
- More weight will usually be given to papers that clearly identify target groups, benefits, lessons learned, good practice and that include measures of critical assessment.
- Papers covering topics/activities which have been reported at a prior IAC must state this explicitly and detail both the additional information to be presented and the added value that will result.

Coordinator

Chris Welch
International Space University (ISU) — FRANCE

E1.1 Ignition - Primary Space Education

This session will focus on all aspects of primary space education, i.e. up to a student age of 11.

Co-Chair

Shamim Hartevelt-Velani
European Space Agency (ESA) — THE NETHERLANDS

Gulnara T. Omarova
Ministry of Transport and Communications — KAZAKHSTAN

Rapporteur

Kerrie Dougherty
Powerhouse Museum — AUSTRALIA

E1.2 Lift Off - Secondary Space Education

This session will focus on all aspects of secondary space education, for students of age 12- 18.

Co-Chair

Kerrie Dougherty
Powerhouse Museum — AUSTRALIA

Dennis Stone
National Aeronautics and Space Administration (NASA)/Johnson Space Center — UNITED STATES

Rapporteur

Vera Mayorova
Bauman Moscow State Technical University — RUSSIA

E1.3 On Track - Undergraduate Space Education

This session will focus on all aspects of undergraduate space education.

Co-Chair

Naomi Mathers
Victorian Space Science Education Centre — AUSTRALIA

Marilyn Steinberg
Canadian Space Agency — CANADA

Rapporteur

Olga Zhdanovich ESA —
THE NETHERLANDS

E1.4 In Orbit - Postgraduate Space Education

This session will focus on all aspects of (post)graduate space education.

Co-Chair

Angela Philips-Diaz
Purdue University — UNITED STATES

David B. Spencer
The Pennsylvania State University — UNITED STATES

Rapporteur

Olga Zhdanovich ESA —
THE NETHERLANDS

E1.5 Enabling the Future - Developing the Space Workforce

This session will focus on the challenges, opportunities and innovative approaches to developing the current and future global space workforce.

Co-Chair

Annalisa Weigel
Massachussets Institute of Technology (MIT) — UNITED STATES

Olga Zhdanovich —
THE NETHERLANDS

Rapporteur

Amalio Monzon
LEEM — GERMANY

E1.6 Calling Planet Earth - Space Outreach to the General Public

This session will focus on activities that aim to promote awareness and understanding of space in the general public.

Co-Chair

Valerie Anne Casasanto
University of Maryland, Baltimore County (UMBC) — UNITED STATES

Carol Christian
STScI — UNITED STATES

Rapporteur

Gulnara T. Omarova
Ministry of Transport and Communications — KAZAKHSTAN

E1.7 New Worlds - Innovative Space Education and Outreach

This session will focus on novel and non-standard methods of space education and outreach in non-traditional areas and to non-traditional target groups.

Co-Chair

Jean-Daniel Dessimoz
Western Switzerland University of Applied Sciences (HESSO.HEIG-VD) and Swiss Association for Astronautics — SWITZERLAND

Vera Mayorova
Bauman Moscow State Technical University — RUSSIA

Rapporteur

Carol Christian
STScI — UNITED STATES

E1.8 Space Culture: Innovative Approaches for Public Engagement in Space

This session is co-sponsored by the IAF Technical Committee on the Cultural Utilisation of Space (ITACCUS) and will focus on the activities of institutions such as museums, space agencies and non-profit organisations invloving space that engage the cultural sector.

Co-Chair

Annick Bureaud
Leonardo/Olats — FRANCE

Frank Friedlaender
Lockheed Palo Alto Research Lab. — UNITED STATES

Rapporteur

Valerie Anne Casasanto
University of Maryland, Baltimore County (UMBC) — UNITED STATES

E2 42ND STUDENT CONFERENCE

Presentation of space-related papers by undergraduate and graduate students who participate in an international student competition.

Coordinator

Stephen Brock
American Institute of Aeronautics and Astronautics (AIAA) — UNITED STATES

Marco Schmidt
University of Wuerzburg — GERMANY

E2.1 Student Conference – Part 1

Undergraduate and graduate level students (no more than 28 years of age) present technical papers on any project in space sciences, industry or technology. These papers will represent the specific work of the author(s) (no more than two students). The students presenting in this session will compete in the 42nd International Student Competition.
This session is NOT for team projects. Team project papers should be submitted to session E2.3. French, German, US, British and Canadian students submitting abstracts for the sessions E2.1 and E2.2 shall apply via the national coordinators:
- for France: Benedicte Escudier at: benedicte.escudier@supaero.fr
- for Germany: Marco Schmidt at: schmidt.marco@informatik.uni-wuerzburg.de
- for USA: Stephen Brock at: stephenb@aiaa.org
- for Great Britain: Chris Welch at: Welch@isu.isunet.edu
- for Canada: Jason Clement: Jason.Clement@asc-csa.gc.ca
The guidelines for the student competition will be distributed from the session chairs to the authors after abstract acceptance.

Co-Chair

Rachid Amekrane
Astrium GmbH — GERMANY

Benedicte Escudier
SUPAERO- Ecole Nationale Supérieure de l'Aéronautique et de l'Espace — FRANCE

Rapporteur

Carsten Holze
machtwissen.de AG — GERMANY

E2.2 Student Conference – Part 2

Undergraduate and graduate level students (no more than 28 years of age) present technical papers on any project in space sciences, industry or technology. These papers will represent the specific work of the author(s) (no more than two students).
The students presenting in this session will compete in the 42nd International Student Competition.
This session is NOT for team projects. Team project papers should be submitted to session E2.3. French, German, US, British and Canadian students submitting abstracts for the sessions E2.1 and E2.2 shall apply via the national coordinators:
- for France: Benedicte Escudier at: benedicte.escudier@supaero.fr
- for Germany: Marco Schmidt at: schmidt.marco@informatik.uni-wuerzburg.de
- for USA: Stephen Brock at: stephenb@aiaa.org
- for Great Britain: Chris Welch at: Welch@isu.isunet.edu
- for Canada: Jason Clement: Jason.Clement@asc-csa.gc.ca
The guidelines for the student competition will be distributed from the session chairs to the authors after abstract acceptance.

Co-Chair

Marco Schmidt
University of Wuerzburg — GERMANY

Thomas Snitch
Little Falls Associates, Inc. — UNITED STATES

Rapporteur

Benedicte Escudier
SUPAERO- Ecole Nationale Supérieure de l'Aéronautique et de l'Espace — FRANCE

E2.3 Student Team Competition

Undergraduate and graduate level student teams present papers on any subject related to space sciences, industry or technology. These papers will represent the work of the authors (three or more students). Students presenting in this session will compete for the Hans von Muldau Team Award.
The guidelines for the student competition will be distributed from the session chairs to the authors after abstract acceptance.

Co-Chair

Stephen Brock
American Institute of Aeronautics and Astronautics (AIAA) — UNITED STATES

Naomi Mathers
Victorian Space Science Education Centre — AUSTRALIA

Rapporteur

Thomas Snitch
Little Falls Associates, Inc. — UNITED STATES

E3 25TH SYMPOSIUM ON SPACE POLICY, REGULATIONS AND ECONOMICS

This symposium organised by the IAA will provide a systematic averview of the current trends in space policy, regulations and economics, by covering national as well as multilateral space policies and plans.

Coordinator

Sergio Camacho
CRECTEALC - Regional Centre for Space Science and Technology Education for Latin American and The Caribbean — MEXICO

Max Grimard
EADS Astrium — FRANCE

E3.1 National and International Space Policies and Programmes

This session will provide a forum for the presentation and discussion of current space policies, programmes and initiatives of national and international organisations. The session will place particular focus on space infrastructure that are critical for economic and quality of life activities.

Chair

Sergio Camacho
CRECTEALC - Regional Centre for Space Science and Technology Education for Latin American and The Caribbean — MEXICO

E3.2 Data Policies in Support of Climate Change and Disaster Management Application

This session will discuss policies, programmes and initiatives that guarantee that space data needed to produce values for the agreed climate variables or for rise in disaster management are made available to scientists, decision-makers and end-users.

Chair

Max Grimard
EADS Astrium — FRANCE

E3.3 Space Economy: Valuing the Uses

Chair

Thierry LE GOFF
EADS Astrium — FRANCE

Rapporteur

Bertrand de Hauteclocque
Bureau d'Economie Théorique et Appliquée. Strasbourg University — FRANCE

E3.4 Effects of Space Weather on GEO Satellites

This session will discuss case histories and mechanisms of effects of space weathers on GEO satellites, models for prediction, and mitigation approaches.

Chair

Werner R. Balogh
United Nations Office for Outer Space Affairs — AUSTRIA

E3.5 / E7.6 27th IAA/IISL Scientific-Legal Round Table «Optical Communication»

The Round Table will address technical development and regulatory aspects of optical communication such as frequencies and protection from interception during data transmission.

Co-Chair

Masahiko Sato
Japan Aerospace Exploration Agency (JAXA) — JAPAN

Pierre Molette —
FRANCE

E4 46th IAA HISTORY OF ASTRONAUTICS SYMPOSIUM

This Symposium organized by the International Academy of Astronautics (IAA) includes history of space sciences, technology and development, rocketry, personal memoirs. The entire spectrum of space history, at least 25 years old, is covered as well as history of rocketry and astronautics in Italy.

Coordinator

Christophe Rothmund
Snecma — FRANCE

Philippe Jung
AAAF — FRANCE

Ake Ingemar Skoog —
GERMANY

E4.1 Memoirs and Organisational Histories

Autobiographical and biographical memoirs of individuals who have made original contributions to the developmen and application of astronautics and rocketry. History of government, industrial, academic and professional societies & organisations long engaged in astronautical endeavours.

Co-Chair

Marsha Freeman
21st Century Science & Technology — UNITED STATES

Herve Moulin
Institut Français d'Histoire de l'Espace — FRANCE

Rapporteur

Niklas Reinke
Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR) — GERMANY

Theo Pirard
Space Information Center — BELGIUM

E4.2 Scientific and Technical Histories

Historical summaries of rocket and space programs, and the corresponding technical and scientific achievements.

Co-Chair

Susan McKenna-Lawlor
Space Technology (Ireland) Ltd. — IRELAND

Kerrie Dougherty
Powerhouse Museum — AUSTRALIA

Rapporteur

Christophe Rothmund
Snecma — FRANCE

William Jones —
UNITED STATES

E4.3 History of Italian Contribution to Astronautics

Special session with invited and proposed speakers. Origin (technical and political aspects) of the space activities and programs of Italy.

Co-Chair

Otfrid Liepack
National Aeronautics and Space Administration (NASA)/Jet Propulsion Laboratory — UNITED STATES

Rapporteur

Philippe Cosyn —
BELGIUM

E5 23rd SYMPOSIUM ON SPACE ACTIVITY AND SOCIETY

This 23rd Symposium organised by the International Academy of Astronautics (IAA) will review the impact and benefits of space activities on the quality of life on earth, including arts and culture, society's expectations from space, life in space, as well as technology and knowledge transfer.

Coordinator

Geoffrey Languedoc
Canadian Aeronautics & Space Institute (CASI) — CANADA

Olga Bannova
University of Houston — UNITED STATES

E5.1 Auditing the Impact of Space Technology on Society

This session will feature stories regarding technologies from space programmes that have, or can, transform and shape our future. This will be based on diverse perspectives regarding the benefits of technology transfer. Sources that validate space technology being applied to new products and activities that highlight the facts. Innovators, entrepreneurs and programme managers will be presented.

Co-Chair

Nona Minnifield Cheeks
National Aeronautics and Space Administration (NASA)/Goddard Space Flight Center — UNITED STATES

Kevin Cook
Space Foundation — UNITED STATES

Rapporteur

Peter A. Swan
Teaching Science and Technology, Inc. — UNITED STATES

E5.2 Space Visualisation Tools - Effect on Societal Needs

This session will focus on the usefulness of space visualisation tools for societal needs. Papers will be presented to describe how information technologies developed in support of space programs have influenced how we function as a society, practical applications of space technologies for data, visualisation outside space programs will be discussed.

Co-Chair

Nona Minnifield Cheeks
National Aeronautics and Space Administration (NASA)/Goddard Space Flight Center — UNITED STATES

Kevin Cook
Space Foundation — UNITED STATES

Rapporteur

Peter A. Swan
Teaching Science and Technology, Inc. — UNITED STATES

E5.3 Human Habitation Beyond Low Earth Orbit

The session welcomes papers on all aspects of the challenges of emplacing, sustaining, and growing accommodations for human habitation at diverse inner solar system destinations: high earth orbits, Lagrange points, planetary orbits, the Moon's surface, Near Earth Objects, the moons of Mars, Mars' surface, and free space. These places share characteristics of the need for basic protection from radiation, vacuum, and thermal conditions in space, but vary widely in their remoteness, proximity to natural bodies and resources, and socio-psychological impact. Their needs for architectural solutions, including pressurised volume, shielding, life support techniques, food production, transportation access, and social accommodation will stretch concepts and technologies for space architecture.

Co-Chair

Brent Sherwood
National Aeronautics and Space Administration (NASA)/Jet Propulsion Laboratory — UNITED STATES

Olga Bannova
University of Houston — UNITED STATES

Rapporteur

Anna Barbara Imhof
Liquifer Systems Group (LSG) — AUSTRIA

E5.4 Space as an Artistic Medium

Since the late 70s and early 80s a small group of artists has been exploring the potential of outer space as a medium for art. The application of space technology, materials, and data, coupled with an artistic vision, has created an art that is highly innovative and far removed from mainstream dictums. Examples of this new artistic genre center on Interstellar Message Composition, Music, Dance in Weightlessness, Vacuum Deposition, Artificial Auroras, Orbital Debris, Water Management, War and Peace, Earth-Imaging, GPS, and the Internet. This session will address the work of contemporary artists who have developed new ways to appropriate space as an artistic medium. Current and future applications of this aesthetic paradigm for space will be examined.

Co-Chair

Richard Clar
Art Technologies — FRANCE

Al Wunderlich
Rhode Island School of Design — UNITED STATES

Rapporteur

Regina Peldszus
Kingston University — UNITED KINGDOM

E5.5 After the Storm - Case Studies

Space system support for disaster mitigation has become significant with monitoring, warning, measurement and recovery. This session will present case studies of how well space systems support the human condition under stress.

Co-Chair

Peter A. Swan
Teaching Science and Technology, Inc. — UNITED STATES

Geoffrey Languedoc
Canadian Aeronautics & Space Institute (CASI) — CANADA

E6 BUSINESS INNOVATION SYMPOSIUM

The symposium will address creative business approaches to serving government and private sector customers, as well as government options for encouraging this activity. The symposium will address the general role of government in encouraging space industry applications, new business models in tradition space industry applications (e.g. satellite-based services involving Earth observation, navigation and communications), and new space industry applications (e.g., space tourism, space-industrialisation, space resource utilisation).

Coordinator

Ken Davidian
Federal Aviation Administration Office of Commercial Space Transportation (FAA/AST) — UNITED STATES

E6.1 Entrepreneurship and Investment for Innovations in Commercial Space Access Activities

Papers submitted to this session address topics of Entrepreneurship and Investment in all aspects of Commercial Space Access concepts, activities and operations. Domains and topic areas addressed include: Orbital or suborbital commercial space access, Commercial launch or re-entry facilities, Commercial launch vehicles, Commercial crewed and unscrewed systems, and Commercial opportunities for secondary, hosted or ride-share payloads.

Co-Chair

Ken Davidian
Teaching Science and Technology, Inc. — UNITED STATES

Joerg Kreisel
International Consultant (JKIC) — GERMANY

Rapporteur

Daniel Faber
Heliocentric Pty Ltd — AUSTRALIA

E6.2. Entrepreneurship and Investment for Commercial in-Space Activities

Papers submitted to this session address topics of Entrepreneurship and Investment in all aspects of In-Space concepts, activities and operations. Domains and topic areas addressed include: On-orbit propellant servicing or depots, Crew-tended or unmanned on-orbit platforms or space stations, Research or new products/services resulting from in-space activities, Communications services, and Entertainment and educational services.

Co-Chair

Aude de Clercq
ESA/ESTEC — THE NETHERLANDS

David Bearden
Aerospace Corporation — UNITED STATES

Rapporteur

Tom Olson
Exodus Consulting Group — UNITED STATES

E6.3 Unique Perspectives of Space Entrepreneurship and Investment

Papers submitted to this session answer some or all of the following questions regarding the characteristics of Entrepreneurship and Investment (E&I) as they might vary as function of country, culture or geographical region: What are the historic and/or current definitions and examples of E&I? What are the historic and/or current definitions and examples of Public-Private Partnership models? What are the real or perceived barriers, obstacles, or opportunities of E&I? What are the real or perceived factors that influence behaviours and public perceptions of entrepreneurs and investors?

Co-Chair

Max Grimard
EADS Astrium — FRANCE

A.C. Charania
SpaceWorks Engineering, Inc. — UNITED STATES

Rapporteur

Kevin Stube
The Planetary Society — UNITED STATES

E6.4 D4.2 Joint Session on Global Public/Private Innovative Initiatives in Spaceflight

This session will cover innovative system concepts in spaceflight activities, including human spaceflight, to reduce the costs of space launch and in-orbit infrastructures while increasing utilisation. The complementary roles of industry and governments at a global scale shall be discussed, initiatives and emerging issues will be presented.

Co-Chair

Horst Rauck
GERMANY

Rachel Villain
Euroconsult — FRANCE

Rapporteur

Sundaram Ramakrishnan
Vikram Sarabhai Space Centre (VSSC) — INDIA

E7 55th IISL COLLOQUIUM ON THE LAW OF OUTER SPACE

This Symposium organized by the International Institute of Space Law (IISL) addresses various aspects of the law of outer space and is structured in five sessions.

Coordinators

Corinne Jorgenson
Advancing Space — UNITED STATES

Mark Sundahl
Cleveland State University — UNITED STATES

E7.1 Nandasiri Jasentuliyana Keynote Lecture on Space Law & 4th Young Scholars Session

In the first part of this session, the IISL will invite a prominent speaker to address the members of the Institute and other congress attendees on a highly topical issue of broad interest. The second part of this session will be especially dedicated to the space lawyers of the future, in that young scholars (under 35 years old) are invited to present a paper on "Space Law – Future Challenges and Potential Solutions" but the IISL is also open to other topics.
Note : All young scholars are requested to submit their paper to THIS session ONLY.

Co-Chair

Tanja Masson-Zwaan
International Institute of Air and Space Law, Leiden University — THE NETHERLANDS

Elisabeth Back Impallomeni
University of Padova — ITALY

E7.2 The Interaction between International Private Law and Space Law and its Impact on Commercial Space Activities

Many current day space activities are undertaken by private commercial entities. Indeed, Article VI of the Outer Space Treaty already contemplated that 'non-governmental entities' would carry out space activities, albeit with the responsibility for such activities remaining with States. As the range of private commercial space activities has rapidly expanded, and the 'industries' that many of them have created represent many billions of dollars, a variety of legal issues arise that require careful thought. Not only are the United Nations Space Law Treaties of relevance, but private law, either on a multilateral or bilateral basis, plays an important role in the regulation of such activities. This session invites contributions that discuss how private law impacts upon, and is influenced by the broader range of international space law rules. Reference may be made to the draft Protocol to the Cape Town Convention on Matters specific to Space Assets, prepared by a Unidroit Committee of governmental experts, due to be finalised at a diplomatic Conference to be held in Berlin from 27 February to 9 March 2012, or to the plethora of contractual, regulatory and national law rules that are relevant to the regulation of private space activities.

Co-Chair

Martin Stanford
Unidroit — ITALY

Paul Larsen
Georgetown University Law Center — UNITED STATES

E7.3 The International Legal Regulation of Outer Space within the Scope of Public International Law

Article III of the Outer Space Treaty confirms that activities in the exploration and use of outer space shall be carried out 'in accordance with international law', with specific reference to the Charter of the United Nations. Moreover, Space Law itself has developed as a branch of public international law. It is evident from the range of space activities that many aspects of public international law - including the Law of the United Nations Charter, International Environmental Law, International Trade Law, International Humanitarian Law, International Human Rights Law - are relevant to the conduct of such activities. These may be through either Treaties or customary law, and it is important to understand how these areas of public international law interact. This session invites contributions that address this interaction, including the difficulties that might be associated with simply attempting to apply existing international law principles developed terrestrially, without any adaptation to the unique environment of outer space.

Co-Chair

Stephan Hobe
University of Cologne — GERMANY

Jean-François Mayence
Belgian Science Policy (BELSPO) — BELGIUM

E7.4 Legal Evidence from Outer Space

Modern societies and their legal systems increasingly rely on technological tools and pieces of evidence to help the enforcement and application of domestic and international law. Space brings valuable and accurate information in the form of precise timing, satellite positioning, land mapping used for building permits, environmental control of pollution, management of maritime traffic and many other growing applications. Several courts and public enforcement officers have already used satellite data and derived information for decisions in many areas. International environmental agreements include space data as an objective mean to control treaty obligations. Papers will be invited to focus on the case law and on the legal solutions available for lawyers, governments and legislators to take benefit of available space technology at the service of jurisdictions.

Co-Chair

Marco Ferrazzani
European Space Agency (ESA) — FRANCE

Ray Purdy
University College London — UNITED KINGDOM

E7.5 Recent Developments in Space Law

In this session, papers are invited to address legal aspects of the most recent developments in space activities that have taken place since the other session topics were determined, i.e. since March 2011 only.

Co-Chair

Corinne Jorgenson
Advancing Space — UNITED STATES

Ranjana Kaul
Dua Associates — INDIA

E7.6 E3.5 27th IAA/IISL Scientific-Legal Round Table «Optical Communication»

The Round Table will address technical development and regulatory aspects of optical communication such as frequencies and protection from interception during data transmission.

Co-Chair

Masahiko Sato
Japan Aerospace Exploration Agency (JAXA) — JAPAN

Pierre Molette —
FRANCE

E7.7 B3.8 Joint IAF/IISL Session on Policy and Law of Human Space Missions

This session hosts papers on topics related to the political and legal aspects of international collaboration in future human space missions and programmes such as the ISS lifetime extension, post ISS activities in LEO or the Lunar Exploration. The session provides a forum to discuss the de jure regulatory framework and de facto implementation of such programmes during the development and operation phases. In addition, the session will address effects of extending the duration and partnership of the ISS programme and lessons learned from past collaborative programmes such as Interkosmos or the Shuttle-Spacelab programmes may be addressed.

Co-Chair

Cristian Bank
EADS Astrium Space Transportation GmbH — GERMANY

Lesley Jane Smith
Leuphana University of Lüneburg/ Weber-Steinhaus & Smith — GERMANY

Rapporteur

Luise Weber-Steinhaus
Astrium Space Transportation — GERMANY

E8 MULTILINGUAL ASTRONAUTICAL TERMINOLOGY SYMPOSIUM

This symposium organized by the International Academy of Astronautics (IAA) will review the progress made in multilingual space terminology and its impact on international cooperation in space. Terminology is a key issue for a better understanding among people using various languages and dialects. Consecutive or simultaneous translation doesn't remove risk of ambiguity during technical meetings and terminology accuracy is essential during all phases of cooperation. The session will address issues such as standardization of definitions in space science and technology. Specific character of space emerging countries will be discussed.

Coordinator

Susan McKenna-Lawlor
Space Technology (Ireland) Ltd. — IRELAND

Danielle Candel
Université Paris Diderot (Paris 7) — FRANCE

E8.1 Multilingual Astronautical Terminology

This symposium organized by the International Academy of Astronautics (IAA) will review the progress made in multilingual space terminology and its impact on international cooperation in space. Terminology is a key issue for a better understanding among people using various languages and dialects. Consecutive or simultaneous translation doesn't remove risk of ambiguity during technical meetings and terminology accuracy is essential during all phases of cooperation. The session will address issues such as standardization of definitions in space science and technology. Specific character of space emerging countries will be discussed.

Co-Chair

Susan McKenna-Lawlor
Space Technology (Ireland) Ltd. — IRELAND

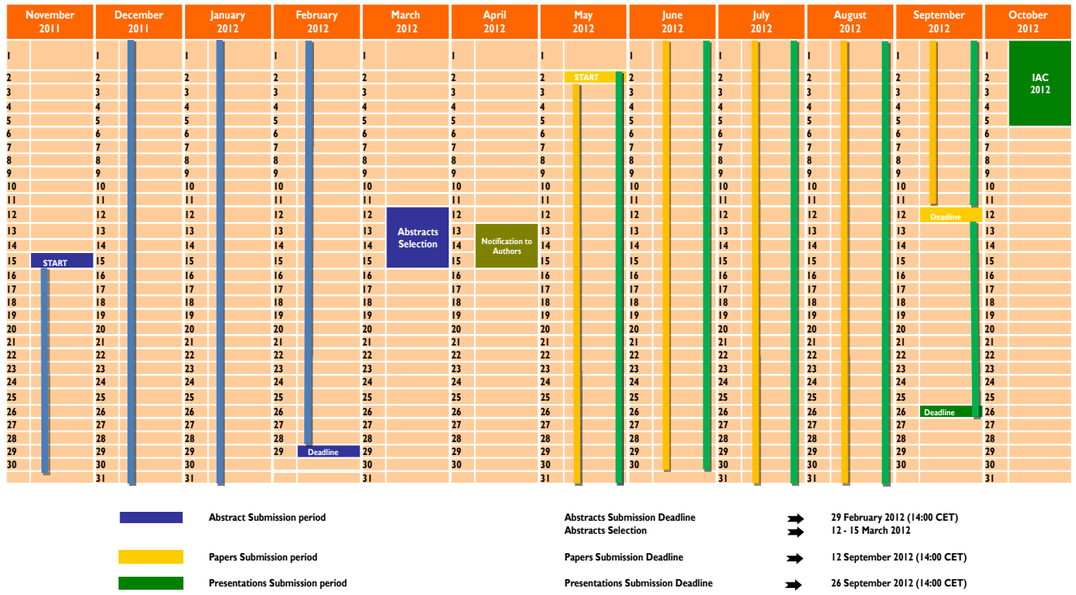
Danielle Candel
Université Paris Diderot (Paris 7) — FRANCE

Rapporteur

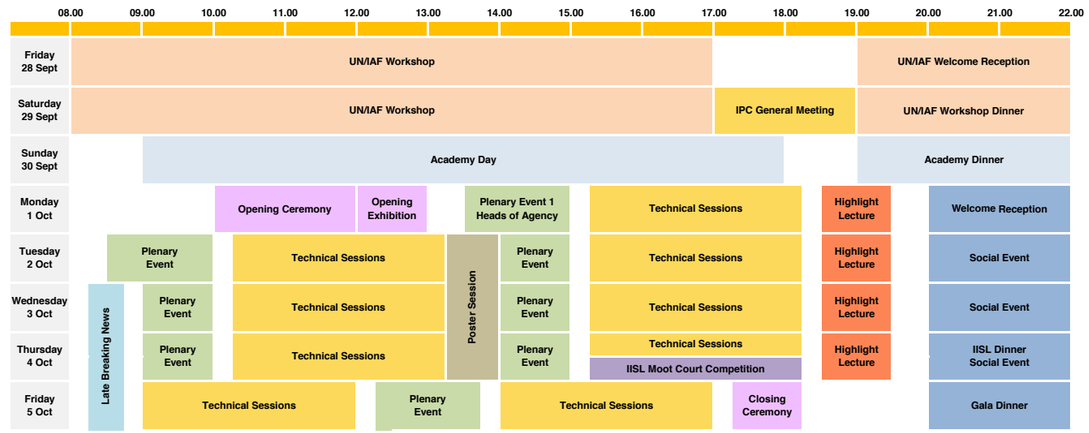
Tetsuo Yoshimitsu
ISAS/JAXA — JAPAN

Fabrice Dennemont
International Academy of Astronautics (IAA) — FRANCE

Calendar of Main IAC 2012 Deadlines



Preliminary Congress at a Glance Chart



Instructions to Authors

Abstract Preparation

Format

- Abstracts must be written in English
- Abstracts length should not exceed 400 words

Content

- Tables or drawings are not allowed in the abstract
- Formulas can be included using the toolbox provided on the abstract submission web page
- Abstracts should specify: purpose, methodology, results and conclusions
- Abstracts should indicate that substantive technical and/or programmatic content is included

Co-authors

- All your co-authors should be added at the time you submit your abstract using the tool provided online. You should register all of them online indicating their name, affiliation, full postal address, phone and email address

Abstract Submission

Signing in

- The submission of abstracts must be done exclusively on the IAF website at www.iafastro.org.
- If it is the first time you submit an abstract on our website, you will need to register yourself.
- In case you have forgotten your password, please use the password recovery utility.

Submission

- Go to the new abstract submission page
- Browse the technical programme and choose the symposium and technical session where you want to submit your abstract
- Type-in the title and content of your abstract in the related fields
- Choose you presentation preference: oral presentation only, poster presentation only, oral or poster
- Indicate if the material is new and original and that it was not presented at a previous meeting.
- Indicate if the attendance at the IAC 2012 to deliver the paper and present it is assured.

Note:

- **An abstract can be submitted to only one Technical Session**

Abstract Selection

Submitted abstracts will be evaluated by the Session Chairs on the basis of technical quality and relevance to the session topics. Selected abstracts may be chosen for eventual oral or poster presentation – any such choice is not an indication of quality of the submitted abstract. Their evaluation will be submitted to the Symposium Coordinators, who will make acceptance recommendations to the International Programme Committee which will make the final decision. Please note that any relevance to the Congress main theme will be considered as an advantage.

Paper and Presentation Submission

- Details on how to prepare and submit your final paper as well as your presentation material will be available on www.iafastro.org by mid-April.
- Authors having a paper accepted for an **oral presentation** will be offered a presentation slot of duration of 10 to 20 minutes.
- Authors having a paper accepted for a **poster presentation** will be asked to prepare and bring an A0 poster to the Congress.

International Astronautical Federation (IAF)

The IAC proceedings will be distributed as a DVD to all regular Congress participants. More information about the IAC paper archive is available on www.iafastro.org.

International Academy of Astronautics (IAA)

Authors should follow the above general procedure. An additional suitability requirement is that the proposed topic must be related to a potential or on-going IAA Study Group activity.

International Institute of Space Law (IISL)

Authors should follow the above instructions for the submission of their abstracts. In addition to the IAC Proceedings DVD, the papers of the Colloquium, along with other materials, will be published in the Proceedings of IISL. Authors who qualify may request to be considered for the Dr I.H. Ph. Diederiks-Verschoor Award for Best Paper. Please contact the IISL secretary for the regulations at secretary@iislweb.org.

DEADLINES

Abstract Submission	29 February 2012 (14:00 CET)
Paper Submission	12 September 2012 (14:00 CET)
Presentation Submission	26 September 2012 (14:00 CET)

Please make sure to check the IAF website regularly to get the latest updates on the Technical Programme!

Space in Italy

Italy has a very long history of achievement within the space industry.

From Giulio Costanzi, who wrote before the First World War of orbital navigation and nuclear propulsion, to Gaetano Arturo Crocco who helped to develop the gravity assist technique vital for use by all solar system exploration probes, Italian scientists have been vital to the modern development of space travel.

Under the leadership of Luigi Broglio (1911-2001), the unanimously recognised father of Italian astronautics, Italy became the third country in the world – in 1964 – to build and operate a satellite in orbit around the Earth. It also was the first country to deploy an equatorial launching pad, the San Marco, and to conduct successful experiments in launching from it.

As one of the earliest countries to be engaged in space exploration, Italy became a founder and key partner in both the European Launcher Development Organisation and the European Space Research Organisation. These two would later merge to form the European Space Agency (ESA).

Since 1988, the Italian Space Agency (ASI) has been coordinating and promoting Italy's activities in the field of astronautics. It has a key role at the European level as the third contributor country to ESA.

Space is a key ground for human evolution: Italy and ASI therefore focus their efforts on the forefront of science and technology in sectors such as telecommunications, civil protection, defence, environmental monitoring and natural resource management.

From essential knowledge about understanding the Universe, the origin of life and experimenting new technologies, space is where humans can broaden their horizons, increase their knowledge and ensure a better future on Earth. Italy is playing a major role in this exemplary human enterprise.

The 63rd International Astronautical Congress will be held in the region of Campania which surrounds Naples.

The worldwide aerospace market is valued at €187 550 million. The aerospace sector in Italy generates about €6000 million (8.1% of the European market) and Campania's 1500 million euros contributes 21% of the entire Italian market.

Campania has 130 aerospace companies including university spinoffs, R&D, SMEs, telecommunications and information technology, mechanical engineering, electronics, automation and important research centres – more than 7% of national aerospace enterprises are based in the region.

The 12 000 employed in Campania represent about 9% of the experts in the national aerospace sector and boasted a 18% growth rate in the years 2004-2005.

The importance of Campania in aerospace technology is evidenced by the presence in the region of prestigious universities, the numerous research facilities and the close interconnection between the industry and R&D.

The tradition of research and technological innovation sees CIRA (Italian Centre of Aerospace Research) as the key player and includes INAF, ENEA, CNR, the Regional Centres of Expertise (MARS, AMRA, CERICT, New Technology, Technapoli), and the consortium of private SME companies such as ALI, SAM and CHAIN.

Prof. Luigi Carrino
President, Campania Aerospace Research and Network

NAPLES – THE CITY

Naples is a city full of life that for about three millennia has become a special and important capital for Mediterranean culture. It is world famous for its artistic contribution, natural beauty and long history.

According to the ancient Greeks and Romans, the origin of Naples is connected to the legend of the beautiful goddess Parthenope. The city is still full of monuments from those ancient times.

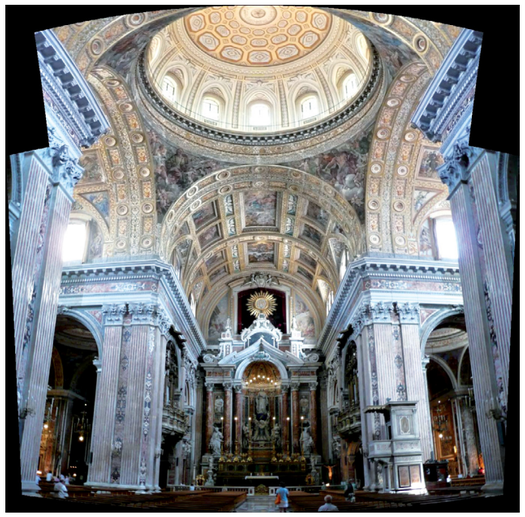
This former regal diva has three royal palaces, a superlative archaeological museum, art collections spanning from the classics to Jeff Koons, and an ancient centro storico bursting with secret frescoed chapels and citrus-filled cloisters. Here, restaurants are family heirlooms.

Matching other global centres, Neopolitans can boast world-class design, trendy bars and cool clubs. Here though, the cutting edge lives side by side with the Naples of neorealist film director Vittorio de Sica's imagination.

A film star in its own right, the fabled Amalfi Coast rolls out to the south. Lush cliffs plunge into creamy - blue seas and chichi coastal towns read like a celebrity roll call. Across the Bay of Naples sits bewitching Capri, home to a neon-blue grottos and holidaying superstars.

But like the city's native thin-crust pizzas, there is more beneath the surface.

Naples is Italy's fourth-richest city. It is the world's 91st richest city by purchasing power, with an annual GDP of $43 billion. Were Naples a country, it would have the world's 68th biggest economy, approaching the size of that of Qatar. Naples is a major cargo terminal, and the port of Naples is one of the Mediterranean's biggest and most important. The city has experienced significant economic growth since World War II.



Furthermore, Naples lies at the heart of the Campania region's aerospace and astronautics sector and has been since the 1930s. Of recent company licences issued, according to statistics from the European Patent Office, 55% were in the field of high technology, and the city has about 100 enterprises dedicated to the aeronautics sector.

In Naples you can find important research centres, two world-class universities and faculties of aerospace engineering, a science park, dedicated technological districts and the Italian Space Agency, ASI.

The ability to innovate, cooperate and network have been the key to the economic success of the area which is still growing faster than the Italian national average – about 8% per year.

Naples – truly a city of the past looking strongly to the future.

CAMPANIA – THE REGION

Campania is the region in southern Italy whose capital is Naples. The region has a population of around 5.8 million people, making it the second-most-populous region of Italy; its total area of 13,590 square kilometres makes it the most densely populated region in the country.

The region has a dense network of road and motorways, a system of maritime connections and an airport at Naples which connect it rapidly to the rest of the country and world.

Campania is rich in culture, especially in regards to gastronomy, music, architecture, archeological and ancient sites such as Pompeii, Herculaneum and Paestum. The name of Campania itself is derived from Latin, as the Romans knew the region as campania felix, which translates into English as «fertile countryside».

While still notable for its agriculture, industry is now especially well-established in the zones around Naples and Salerno. Companies such as Olivetti came to prominence especially after the end of the Second World War and the region has continued to specialise at the high-end of technology. The services sector makes up 78% of the region's gross domestic product.

IAC 2013

Beijing, China

中国·北京

IAC 2012 Naples
Organising Comittee

c/o ASI
Viale di Villa Grazioli, 23
00198 Rome (Italy)
E-mail: LOC@naples-iac2012.it

International Astronautical Federation
94, bis Avenue de Suffren
75015 Paris, France
Tel: +33 1 45 67 4260
Fax : +33 1 42 73 21 20
E-mail: info@iafastro.org
www.iafastro.org